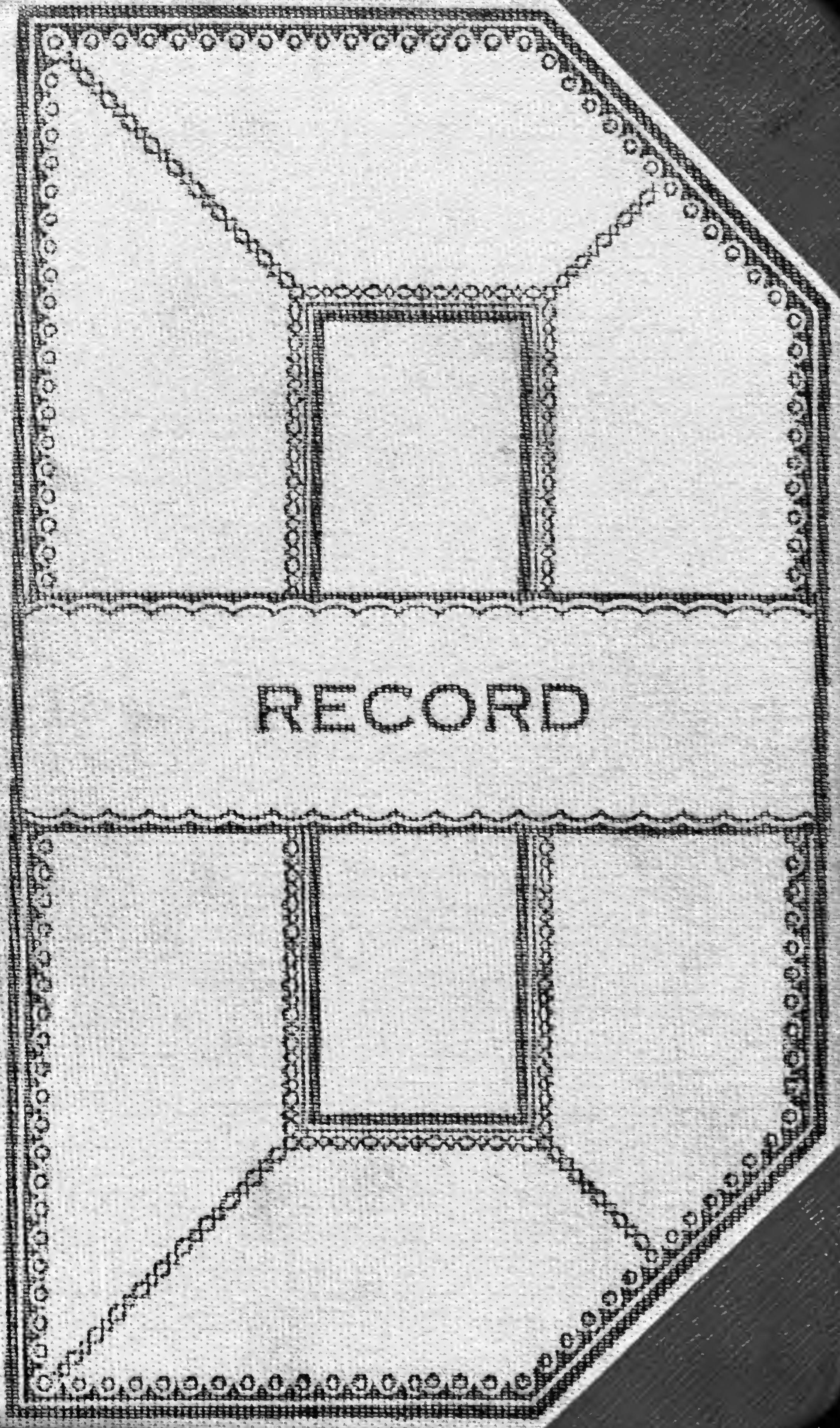


1873-74/36

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Collection No Book #11

Nos 21393 - 22136

Dec. 8, 1943 - Aug. 20, 1944

Colombia

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Collection and Field Note Book

No. 11

(Dec. 8, 1943 - August 20, 1944)

(21393 --- 22136)

COLOMBIA

Cundinamarca

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y recibe propina.







December 7, 1944

To: Fred W. Pearman, Chief, Colombian Cinchona Division  
From: Tom Bellis, Chemist  
Subject: Antioquia Remijia as a Possible Source of Quinidine

Reference is made to my memorandum of November 22, subject "Quinidine Sources and Experiments," in which I promised to review our files of analyses with the purpose in mind of locating possible sources for the alkaloid quinidine.

I find that our Dr. Gore submitted 10 samples of Remijia bark from a region which we designate as number 46, at elevations below 650 meters, in the Departamento de Antioquia. These samples were submitted under Dr. Gore's Nos. 666, 667, 669, 670, 839, 857, 859, 860, 861, and 864. One of these samples gave no more than traces of any of the alkaloids quinine, cinchonidine, cinchonine, and quinidine. The other nine samples gave interestingly high quinidine assays, the average for the nine amounting to 0.8% quinidine. I have drawn from storage these nine samples and have reanalyzed them. The reanalyses agree within the expected errors of analysis with the original work. The greatest deviation between reanalyses and original analyses on the percent of quinidine is 0.1%. The average of the nine reanalyses amounts to 0.8%.

This Antioquia Remijia bark would not appear to be exploitable either as a source of quinine or as a source of totaquina. Most of the samples did not yield sufficient tartrate precipitate of quinine plus cinchonidine to enable me to determine the proportion of quinine. However, it is my judgment that the nine samples analyzed will not average more than 1% of the alkaloid quinine. The average for the sum of the alkaloids quinine, cinchonidine, cinchonine, and quinidine for the nine samples amounts to less than 1.7%.

Upon original analysis I was somewhat skeptical that the material appearing as quinidine in the analysis was actually that alkaloid. Hence upon reanalysis I have converted the quinidine hydriodide precipitate into quinidine alkaloid and thereafter into quinidine sulfate. I am convinced that the alkaloid reported as quinidine is actually quinidine. I attach hereto a small exhibit of the quinidine sulfate prepared from the residue obtained upon reanalysis of these samples.

The first paragraph of Mr. McDermott's letter on the subject "Quinidine Sources and Experiments" is:

"The demand for quinidine is so great that all possible sources must be developed in an effort to maintain minimum stocks of this drug."

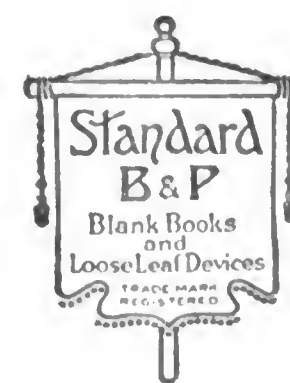


2-Fred W. Pearman-12/7/44

We think that this gives voice to a sufficiently urgent need for quinidine to warrant our making the following suggestions with respect to further investigation of Antioquia Remijia as a source of quinidine: We suggest that it would be advisable for Dr. Core's reports of these explorations to be reviewed and for one of our men to return to the region from which Dr. Core's Remijia samples were collected and harvest from a large number of trees a composite lot of bark which will weigh when dried as much as 60 kilograms. This very thin bark offers no problem in drying. We wish to have sent to our laboratory in Bogotá a 10 kilogram representative aliquot from the 60 kilogram composite. The remaining 50 kilograms should be properly packed and shipped by air express to our administrative offices in Washington. In connection with the shipment of this bark, we think that a memorandum should be sent concerning it and asking that from the lot of bark large samples be furnished to each American extractor which is regarded as capable of producing USP quinidine sulfate. We think that they who receive samples from this lot of Antioquia Remijia should be requested to advise whether or not they can use this bark for the manufacture of quinidine sulfate USP. If one or more of the American extractors does regard this bark as a promising source for quinidine, we think that the administrators in Washington should issue an authorization for the purchase of this bark, suggesting prices based upon the amount of quinidine contained in the bark. We think that the authorization should designate the bark as Remijia bark.

TB GHB





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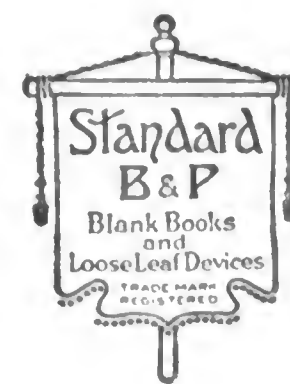
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Ft	M
0	0
10	3
20	6
50	15
100	30
200	60
300	90
400	120
500	155
600	185
700	215
800	250
900	280
1000	310
1100	340
1200	370
1300	400
1400	430
1500	460
1600	490
1700	525
1800	555
1900	585
2000	615
2100	645
2200	675
2300	710
2400	740
2500	770
2600	800
2700	830
2800	860
2900	890

Ft	M
3000	925
3100	955
3200	985
3300	1015
3400	1045
3500	1075
3600	1110
3700	1140
3800	1170
3900	1200
4000	1230
4100	1260
4200	1290
4300	1325
4400	1355
4500	1385
4600	1415
4700	1445
4800	1475
4900	1505
5000	1540
5100	1570
5200	1600
5300	1630
5400	1660
5500	1690
5600	1725
5700	1755
5800	1785
5900	1815
6000	1845
6100	1875
6200	1905

Ft	M
6300	1940
6400	1970
6500	2000
6600	2030
6700	2060
6800	2090
6900	2125
7000	2160
7100	2200
7200	2230
7300	2260
7400	2290
7500	2325
7600	2355
7700	2385
7800	2415
7900	2445
8000	2475
8100	2515
8200	2550
8300	2580
8400	2610
8500	2645
8600	2675
8700	2715
8800	2735
8900	2765
9000	2805
9100	2835
9200	2870
9300	2900
9400	2930
9500	2960

Ft	M
9600	2990
9700	3030
9800	3060
9900	3090
10000	3135
10100	3165
10200	3200
10300	3230
10400	3260
10500	3290
10600	3320
10700	3350
10800	3380
10900	3415
11000	3445
11100	3475
11200	3505
11300	3535
11400	3565
11500	3600
11600	3630
11700	3660
11800	3690
11900	3720
12000	3750



with  
F. J. Hermann  
Dec. 8 - Santuario, west shore  
of Laguna de Fúquene, ~~5 km~~  
22 km. n. of Ubaté, Cundinamarca  
lake shore, hard clay.

L 21393 *Polygonum segetum* HBK 2650 m. det. MCF.

L 294 *Scirpus*  
forming patches on shore and  
islets just off shore, solid stand

L 95 *L. ...*  
floating

Dec. 8 - 5 km. s. of Puente Nacional,  
east of Rio Suarez, Santander  
in second-growth 2050-2150 m.  
brush along roadside.

L 96 *Cinchona pubescens* Vahl ...  
steep slope

L 97 *Cinchona pubescens* Vahl ...  
steep slope

more or less erect, fls. bright pink.  
culms up to 3 m. tall,  
rhizomes deep in mud,  
culms ~~triangular~~ 3-sided  
with rounded angles.  
leaves with very thick  
spongy aerenchymatous  
tissue beneath.

2050 m.

tree 4 m. tall, 10 cm. thick,  
lvs. very slightly glossy  
above, red-veined beneath,  
old leaves red. (bark  
sample X bark dead in spots)  
tree 5 m. tall, 10 cm. thick,  
diseased, trunk partly  
dead, fls. red without,  
pink within.



Dec. 9 - La Gomez, Magdalena Valley, Santander. (Obs. from train)  
 While this <sup>flat</sup> country is mainly wooded, in the vicinity of the railroad are large open flats of white sand, like the N. J. pine barrens. Whether these ~~flat~~ clearings are

Dec. 11 - Magdalena River opposite Simiti, (Obs. from steamer)

Here the real forest is usually some distance from the actual river banks, the intervening space being sand-flats covered with *Cuphea* sp., *Cassia* sp. (aff. *alata* but without winged pods), *Gynerium*, *Salix humboldtii* (diffuse form), clumps of a large sedge (*Scleria*?), and masses of a large grass. The latter is the first important successional stage. Forest apparently seldom becomes established on these flats because they are cut away and redeposited so frequently. The first forest stage is *Cecropia*, in almost pure stands. Occasional *Caiba* trees persist long enough to become quite large. A number of other trees, probably

man-made or not is not at all apparent from the train. It is interesting that where *Remigia purdieana* grows here also should be in sterile acid soil.

legumes, come in after a time. This is the first place I have seen *Salix humboldtii* where it is undoubtedly natural.

A heron, called "garza" is very common, similar to our great blue h. Kingfishers & terns also common.

Rather few people here. Occasional villages and isolated houses. *Cocos nucifera* grows in the villages. A small palm is common on the flats.



- 19 ✓ Dec. 11 - Gamarrá, east bank  
of Rio Magdalena, Dept.  
de Magdalena  
muddy weedy flat <sup>60</sup>~~50~~ m.  
back from river.

L 21398 <sup>3</sup> Mimosa

L 299 <sup>2</sup> ~~Mimosa~~

L 21400 <sup>3</sup> Ipomoea

L 201 Ipomoea

L 302 Jussiaea  
~~prostrate~~, spreading  
over mud in sun, occasional  
bunches climbing in bushes

L 603 Cassia  
dominant plant in flat

- ✓ Dec. 12 - Torre de los Indios, head of  
Quebrada Santa Inez, on cable way  
e. of Gamarrá, Dept. de Magdalena  
talus below road 1200 m.  
in eroded land, appearing rather  
dry, at least at this season.

L 209 Salvia

L 210 ~~Cory~~

L 211 Borreria

L B 12 ~~Labellia~~ Diplocampylus

- spreading, vine-like shrub.  
fls. whitish, turning brown.  
leaves very sensitive  
winning climbing over  
bushes, petals yellow.  
twining vine, <sup>caespitose</sup>, climbing  
over bushes, corolla yellow.  
twining vine climbing  
over bushes, juice watery,  
fls. white.  
prostrate, clusters of  
roots enlarged, white,  
strong, petals white,  
obovate, about 1 cm. long,  
quickly caducous in afternoon.  
shrub up to 3 m. tall  
or more, flowers greenish  
yellow, fruits pendulous,  
cylindrical.

fls. blue-lavender

fls. lavender

fls. white

fls. bright red, mouth almost  
closed



✓ Dec. 13 - Balcones, ridge at head  
of Quebrada de Miraflores,  
7 km. n.n.w. of Convención,  
Norte de Santander 1400 m.  
moist second growth forest  
on steep slope.

L 21404 *Cinchona pubescens* Vahl

L 14 05 *Ladenbergia hookeriana*  
undergrowth, occasional

L 1 06 *Cephaelis*  
undergrowth, occasional

L 8 07 *Cosmibuena*  
abundant in a colony of  
several acres.

L 3 08 *Coccyzpselum*  
common along trail

(for next no. see p. 6)

Two quinas have been  
harvested here - C. pub. +  
# 21405

Anal Bellis

q+c = 1.0

cin = 0.7

quin = n.m. tr

T.C.A = 1.7

Anal Bellis

q+c = n.m. tr

cin = 0.9

quin = n.m. tr

T.C.A = 0.9

groun sprouts from an old  
stump, largest sprout  
4 cm. diam., 4 m. tall, leaves  
with red veins, turning  
red when old. (bark sample,  
compare with # 21405) "quina roja"

small tree 6 cm. diam.  
5 m. tall, young leaves  
dark purple, fls. white,  
corolla lobes thick, fleshy.  
(bark sample, compare with # 21405)

"quina morada":

shrub 1.5 m. tall, bracts  
scarlet, fl. yellow.

tree 8 m. tall, 2 dm. thick  
at base, leaves glossy,  
coriaceous, turning red  
when old, fls. white,  
turning cream-yellow when old,  
very fragrant with a heavy,  
cloying sweet odor.

prostrate, fls. purple,  
fruits soft, fleshy, bright  
blue, dropping readily.



52

21

L

21413

- ✓ Dec. 14 - La Camaronera, 8 km. w. of  
Ocana, on Magdalena - Norte de  
Santander boundary 1850 m.  
moist wooded ridge  
*Ladenbergia hookeriana*

Anal Bellis  
O+q+c - n.m. tr  
cin - 0.6  
quin - n.m. tr  
T.C.A - 0.6

- ✓ Dec. 14 same loc. but in  
Norte de Santander 1700-1800 m.  
moist forest

L

2

14 *Borreria*

edge of thicket in grass along trail

L

4

15 *Borreria*

edge of thicket in grass along trail

L

3

16 *Ladenbergia*

edge of woods

L

3

17 *Stachytarpheta*

common along trails in openings

L

7

18 *Rondeletia*

common in wood on ridge

L

2

19 *Selaginella*

common in woods on ground

L

12

20 *Cinchona pubescens* Vahl

common

L

1

21 *Rup. cinchonoides*

Anal Bellis  
q+c - n.m. tr  
cin - n.m. tr  
quin - n.m. tr  
T.C.A - n.m. tr

Branches  
q+c - n.m. tr  
cin - n.m. tr  
quin - n.m. tr  
T.C.A - n.m. tr

sparsely branched  
small tree 8 cm. thick, 5 m. tall,  
young leaves purplish-green,  
flowers white, fragrant,  
corolla lobes ~~thick~~ thick, fleshy  
(bark sample) "guina morada".

fls. white

tree 10 m. tall. fls. white.

erect herb 1.5 m. tall  
fls. rose-red.

small tree 5 m. tall,  
fls. rose-pink within,  
coral red without

small tree 20 cm. thick,  
10 m. tall, leaves with  
reddish veins, a few turning  
red when old, buds only.  
(bark samples from trunk  
& branches less than 5 cm. thick).  
sterile tree, fallen but  
still growing, stipules pale-green.



L 14 22

*Ladenbergia*dense forest, tangled with lianas  
clay soil.

L 2 23

*Cephaelis axillaris*

Anal. Ballis

Q. + L. mm. 21.

Ci. (?) 0.7

qui m. m. tr.

TAX 0.7 (?)

see  
C. 9. 6Dec. 15 - Region around Ocaña,  
Norte de Santander 1000 m. ±

This area presents one of the most serious cases of erosion I have seen in Colombia. The surface soil seems to be completely washed away, leaving in places bare rock, other places a reddish subsoil. Where the subsoil remains a thin grass cover exists. In other places there is deep gullying. The only tree vegetation is patches of scattered *Clusia* sp. with a few other trees. Long years of misadventure are indicated. The aspect is dreary and much more desert-like than the climate would suggest.

tree 20 m. tall, 30 cm. thick,  
fruit immature.  
(bark sample)

suffrutescent herb, m. tall,  
fls. white, fruit blw, fleshy.

Dec. 15 - Region between  
the divide ~~and~~ bet. the  
Magdalena drainage and  
that of Ocaña, and  
the Rio Magdalena, along  
the cable-way. 1500 - 60 m.

The forest on the steep  
upper slopes is a dense  
moist type where it hasn't  
been cleared. Lower down  
it very soon becomes  
dry, with many leguminous  
trees. On the flat part,  
it is quite dry, in  
places open and grassy.  
Legumes, *Bombacaceae*,  
*Cochlospermum*, and other  
dry-land trees predominate.  
The gullies and low  
spots have much more  
dense vegetation, much  
over-grown with lianas.

Near Gamara are a  
couple of fair-sized lakes  
with a well developed  
shore vegetation.



Jan. 31 - Highway between  
Cartagena and Barranquilla,  
Bolivar - Atlantic  
(observations made from  
automobile windows.)

Practically all of this  
area would be classed  
as "thorn forest" and,  
at this season, is such  
that many of the trees  
are bare of leaves.

The eastern half is  
a low brushy vegetation  
with scattered larger  
trees, largely *Huacapistans*,  
with some *Bombacaceae*  
and larger legumes.  
Much of the smaller  
vegetation is of leguminous  
shrubs and small trees,  
also *Cordia* sp.

The western half  
is more hilly, of tilted  
sedimentary beds,  
more moist, and with  
a more luxuriant vege-  
tation. The lower places  
are almost marshy,  
while the slopes are wooded.  
*Bombacaceae* and palms  
of a number of sorts  
are the most prominent  
components of the vegetation.  
This part is also much

more cultivated than  
the other, much of  
the cultivation being  
of plantains and  
cotton, also *Ipomoea*  
*Ipomoea* (a few *Ipomoea*  
were seen in both  
sections. There was  
a much mixed  
stock, with a  
considerable number  
of horses, *Ipomoea*  
characteristic of the  
area, appeared over the field  
and, as far as I know,  
there were no evidences  
of what ever, of  
"muches" or bit-flies.

The local people did  
not recognize the term  
"muché". There was  
no obvious evidence  
of over-grazing, but  
the soil looked gray and  
sterile.

In the west were  
some low, flat  
marshy-grassy  
areas, as well as  
a large lake. The latter  
had little marsh or  
aquatic vegetation  
around it.



- Feb. 1. - Barranquilla, (outskirts  
of Barrio del Prado), Atlantico  
Dry roadsides and bush patches (1 m.  
7 m. tall).
- L 2 1424 open vacant lot
- L 3 25 *Heliotropium*  
common in open vacant lot
- L 2 26 *Boerhavia*  
roadside, common
- L 3 27 *Leguminosae*  
bush patch
- L 2 28 *Boerhavia*  
common along roadside
- L 3 29 *Tribulus cistoides*  
common along roadside
- L 3 30 *Euphorbia*  
common along roadside
- L V 1 31 *Euphorbia*  
roadside
- L 3 32 *Evolvulus*  
open vacant lot
- L 2 33 *Amorpha*  
abundant in edges of thickets
- L 3 34 *Euphorbia*  
bush patches
- L 4 35 *Tixis*  
common in bush patches

spreading-ascending  
- suffrutescent herb, fls. white.  
ascending herb, much  
branched at base, branches  
up to 0.7 dm. long, fls. white.  
ascending herb, leaves  
white beneath.  
shrub 2.5 m. tall, leafless  
at this season. flowers  
white, banner with  
yellow-green center,  
frilled with purple pencilling.  
ascending herb from  
thick root, lvs. white beneath.  
very prostrate, extensively  
spreading, flowers bright yellow.  
arching, gland white,  
- plant lactiferous.  
arching, stems and  
- inflorescences pinkish.  
prostrate

tangled herb 0.5 m. tall  
and 1 m. across.  
shrub 2 m. tall, leafless  
at this season, banner  
white with greenish-yellow  
center, wings lavender.  
straggling shrub 1-2 m. tall  
heads yellow, rays fading  
to white.



L. 1436

5

bush patches, occasional

L. 37

bush

occasional in bush patches

L. 2 38

bush

edges of thickets, common

L. 2 39

bush

occasional in bush patches

L. 3 40

Boerhaavia

common along roadside

✓ Feb. 7 - small tributary of  
Rio Negro s. of Perwita, 7 km.  
n.w. of Villavicencio, Meta  
moist forest on steep  
s. slope 1000 m.

L. 2 41

~~Calypophyllum~~ Scheyocalyx

L. 9 42

Remigia pedunculata (Karst.)

"mancha" or patch with  
a considerable number of trees.

L. 7 43

Remigia pedunculata

(same as #21442)

Anal Bellis  
q+c 1.7  
lin 0.3  
quin 1.5  
T.C.A 2.0

semi-scandent shrub  
forming tangled patches,  
leaves stiffish, flowers  
yellow-green.

tangled weak shrub  
forming a mound 1 m.  
tall, ~~on~~ corolla yellow-green.  
leafless, stems green,  
corolla red.

shrub 1 m. tall, tips  
of branches dying back  
as it ~~was collected~~ is  
a dry season.

erect ~~or~~ or ascending,  
apparently annual,  
leaves white beneath.

slender tree 8 m. tall, 1 dm.  
thick, flowers white, calyx  
~~bracts~~ greenish white.

slender tree 8 m. tall,  
part of fruits open,  
mostly not.

slender tree 8 m. tall, fruit  
not quite mature (bark  
sample)



20

1944 - Colombia

✓ Feb. 7 - just <sup>n.</sup> of Servitá,  
10 km. n.w. of Villavicencio,  
valley of Rio Negro, Meta.  
patch of moist forest  
on bench on side of canyon.

1000 m.

L. 444 Eugenia  
edge of clearing  
L. 4 45 Acaia  
common in under-growth

L. 4 46 Cephaelis  
common in under-growth

✓ Feb. 13 - just below San Miguel,  
toward Fusagasuga on road  
from Bogotá, Cundinamarca

L. 4 47 Begonia  
common on vertical banks  
in ~~the~~ wet brush

de Guasca,

Forberg ✓  
E. Valencia Feb. 13 - Paramo, 8 km. <sup>n.e.</sup> of  
Guasca, Cundinamarca  
open bushy slopes with  
seeps of water.

L. 1 48 Hedysotis mutica Wedd.

small rocky opening

L. 4 49 Jamesonia  
ledges

L. 2 50 Gentiana  
vertical banks

Meta - Cundinamarca

small tree, fls. white,  
ripe fruit black  
- suffrutescent herb 1 m.  
tall, fls. between crimson  
and scarlet.

- shrub 2 m. tall, fls. white,  
bracts whitish, turning  
purple, ripe fruit purple-black.

plant fleshy, elongate,  
fls. brilliant scarlet,  
pendent.

forming a mat. flowers  
scarce at this season, lavender.  
fronds strictly erect.

forming abundant  
rosettes on slender  
decumbent stems,  
fls. purplish (really  
whitish with dark purple  
markings).



- L. 2 1451 *Bomarea*  
vertical bank
- L. 2 52 *Luzula*  
vertical bank
- L. 2 53 *Lycopodium*  
vertical bank
- L. 1 54 *Juncus*  
wet place
- L. 2 55 *Carex*  
small openings, common
- L. 2 56 *Gaultheria*  
in dwarf bush
- L. 2 57 *Chusquea weberbaueri* Benth.  
common in various places
- L. 3 58 *Hedyotis*  
common on brushy slopes
- L. 1 59 *Vicia*
- L. 3 60 *Senecio*  
common in open places  
and along road.
- L. 1 61 *Galium hypocarpium*  
in dwarf bush
- L. 2 62 *Paepalanthus*  
rare on grassy wet slopes

plant from deeply buried  
tuberiferous rhizome, tubers  
white, translucent,  
flowers orange-red with  
anthers and tips of  
perianth green.  
leafy stems decumbent

culms & bracts cylindric.

in tufts

fls. pink, fruits black, fleshy.

clumps, culms very  
variable in size and  
height, infl. black.  
erect, up to .7 m. tall,  
leaves white beneath,  
fls. purple outside,  
white within.

fls. dark purple.  
branching at base,  
erect, heads nodding,  
stem and involucre  
maroon, rays brilliant  
purple, disk maroonish.  
vine-like, tangled in  
bush, fruits orange, fleshy.  
forming small dense  
cushions.



21463 *Hedyotis* ~~m. l.~~  
common on ledges, banks and  
in openings.

L. 3 64 *Juncus*  
common in muddy places

L. 5 65 *Gunnera*  
common in wet places

L. 2 66 *Nertera granadensis*  
common creeping over  
ledges.

✓ Feb. 13 - Rio Juiquia, 15 km.  
s.s.e. of Guasca, drainage of  
Rio Lueva, Cundinamarca  
~~common~~ moist forest. 2800 m.

15 67 *Ladenbergia undata*  
common

L. 3 68 *Nertera granadensis*  
common in openings

✓ Feb. 19 - Rio Blanco, a small  
affluent of Rio Piedra de Sal,  
drainage of Rio Lueva,  
12 km. w. s.w. of Junin, Cundinamarca.  
moist bushy forest, in places  
with dense and extensive  
*Chusquea* thickets.

L. 69 *Palicourea*  
steep slope

forming extensive mats,  
buds very scarce at this  
season, purple, leaves  
conspicuously glossy  
and 4-ranked.  
small tufts, culms  
and bracts terete.  
rhizome short, apex  
without mucilage,  
leaves extremely rough.  
prostrate, flowers  
greenish-white, fruit  
~~red~~ vermillion.

small tree 6 m. tall, others  
much larger, <sup>leaves</sup> flowers  
white, very fragrant.  
prostrate, extensively  
creeping, fruit vermillion,  
juicy.

In this valley *Cinchona*  
*officinalis* (form with short  
fruit and carinate stipules)  
is well distributed between 2500 m.  
and 2700 m., not seen above  
this. called "quina tuna".  
All had stem cankers.  
weak shrub 3 m. tall, infl.  
yellow, corollas pale yellow,  
turning dark purple with age



- L 71470 *Cinchona officinalis* L.  
edge of clearing
- L 71 *Cinchona officinalis*  
~~at edge of clearing~~ clearing with  
many young trees
- L 72 *Cinchona officinalis* L.  
small patch of woods  
on ridge top.
- L 73 *Cinchona officinalis* L.  
wooded ravine, w. slope.
- L 74 *Cinchona*  
epiphytic on trunk of  
*Cinchona* tree
- L 75 *Cinchona officinalis* L.  
wooded ravine, w. slope
- L 76 *Palicourea*  
wooded slope
- L 77 *Cinchona officinalis* L. B  
wooded ~~slope~~ ridge
- L 78 *Cinchona officinalis* L. A  
wooded ridge

Anal. Pellet	9+6	5.3
(9504)	5.8	5.8
Ca	4.3	1.0

- 2500 m. slender tree 8 m. tall,  
6 cm. thick, leaves  
somewhat glossy, older  
ones tending to be reddish  
on veins + petiole, buds  
purple, fruit immature.  
stipules carinate.
- 2600 m. tree 5 m. tall, slender,  
flowers dark purple  
with white hairs.  
lvs. somewhat glossy, green.
- 2610 m. tree 7 m. tall, leaves  
crimson when old,  
green when young, fruits  
reddish.
- 2675 m. tree 12 m. tall, 16 cm. thick,  
leaves green, rather glossy.  
flowers purple with white  
hairs. (bark sample)  
leaves thinly fleshy,  
flowers scarlet.
- 2675 m. sapling 4 m. tall, 4 cm. thick,  
stem with dead spots,  
very brittle. sterile  
leaves green, somewhat  
glossy above. (bark sample)
- 2700 m. shrub 3 m. tall, flowers  
and infl. purple, nodding.
- 2700 m. sapling 3 m. tall, sterile,  
leaves glossy, midribs  
red.
- 2700 m. small tree 5 m. tall, 6 cm. thick  
sterile, leaves slightly  
reddish. (bark sample)

Anal. Pellet	9+6	5.0	Ca=2.3
(9504)	3.0	1.7	Ca=1.7
Ca	1.7		
quin	5.7		
T.C.A.	5.7		

Anal. Pellet	9+6	5.5	Ca=1.1
(9504)	1.8	1.1	Ca=2.4
Ca	1.1		
quin	4.6		
T.C.A.	4.6		

Anal. Pellet	9+6	1.4
(9504)	0.2	6.9
Ca	6.9	



- L 21479 *Fuchsia*  
brushy ridge
- L 4 80 *Centropogon ferrugineus*  
brushy ridge
- L 1 81 *Tropaeolum*  
brushy ridge
- L 3 82 *Fuchsia*  
brushy ridge
- L 1 83 *Solanum*  
Trail-side
- L 3 84 *Borreria bracteata*  
pasture
- L 6 85 *Psychotria*  
wooded slope
- L 7 86 *Hedyosmum*  
wooded slope, abundant
- L 5 86a *Weinmannia*  
wooded slope, abundant

- 2750m weak, semi-scandent  
shrub 3 m. tall, flowers  
bright vermillion, pendent,  
leaves rather glossy  
on both surfaces, slightly  
paler beneath, fruit  
fleshy, purple when ripe.
- " weak sprawling shrub,  
flowers deep orange,  
paler within. column  
pale yellow, anthers black.  
vine tangled in bushes  
spur of flower vermillion,  
lobes green
- " weak, semi-scandent  
shrub, stems purple,  
leaves dark green ~~at~~ and  
dull above, pale and  
slightly glossy beneath,  
corolla ~~area~~ deep crimson,  
pendent.
- 2800m erect, suffrutescent,  
- fls. white, pendent.  
forming hummocks,  
densely tangled and  
mat-like, fls. white,  
- leaves stiff.
- erect shrub, up to 1 m. tall,  
calyx and young leaves  
purple, fruit blue.
- small tree, aromatic  
when broken. "grauzo"  
tree 10 m. tall, bark used  
for tanning. "encino".



- L. 1437 *Hedyosmum*  
 wooded slope, abundant
- L. 188 *Asplenium*  
 dense woods, Chusquea  
 thicket
- L. 589 *Weinmannia*  
 dense woods, common
- L. 390 *Hydrocotyle*  
 openings in woods, common
- L. 391 *Drymaria*  
 along trail in woods
- L. 492 *Cestrum*  
 edge of ravine.
- L. 193 *Drymaria*  
 open grazed slope

21 km. w.  
 of Facatativá

- L. 94 *Cinchona pubescens* Vahl  
 shade tree in coffee  
 plantation, occasional  
 on n. w. slope.

Feb. 27 - Between Las Delgaditas  
 and Brasili, ~~21~~ km. 50 on  
 road from Manizales to Honda,  
 about 12 km. n. w. of Herveo, Tolima  
 mossy road cut in 3150 m.  
 wooded ravine, open to sun.

- L. 195 *Epilobium*
- L. 196 *Castilleja*

- 2900 m. small tree, fruit  
 translucent white.
- " tree 10 m. tall, fls.  
 white.
- " extensively creeping
- " prostrate, fls. white,  
 petals bifid to middle.
- 2800 m. bush 2 m. tall, flowers  
 greenish yellow.
- " prostrate, flowers white.

Anal Bellis  
 q+c 3.3  
 ci 3.3  
 qui 3.3  
 T.C.A

tree 30 cm. diam. and  
 15 m. tall, flowering  
 abundantly.

bushy, fls. purple, nodding  
 when in bud.  
 suffrutescent, 0.8 m. tall,  
 calyx red, corolla yellow.



L 21497  
4L 3 98 *Nertera granadensis*  
abundant✓ Feb. 28 - <sup>1 km. n.</sup> ~~near~~ San Clemente,  
north of Anselma, Caldas  
wooded ridge top 2230 m.L 6 99 *Palicourea*L 21500  
4 *Palicourea*L 4 01 *Ladenbergia*  
occasionalL 11 02 *Cinchona pubescens*  
common✓ Feb. 28 - Headwaters of Quebrada  
Minas, one of the headwaters  
of Rio Medellin, just north  
of Alto San Miguel, <sup>3</sup> 15 m. s.  
of Caldas, Antioquia 2300 m.L 7 03 *Cinchona pubescens*  
bushy slopesmall tufts, fls. minute,  
- straw-colored.  
forming mats, fruit scarlet.shrub 2.5 m. tall, infl.  
deep orange, corolla  
- deep blood red, fruit black.  
shrub 2.5 m. tall, infl.  
- purple, fruit immature.  
small tree 5 m. tall, all  
seen were sterile.small tree or clump  
of stump sprouts  
5 m. tall, leaves dull above,  
quite purplish beneath,  
turning red when  
old, flowers fragrant,  
dull dark coral red outside,  
lobes whitish within.small tree 6 m. tall, leaves  
dull above, veins slightly  
reddish beneath, flowers  
fragrant, dull red without,  
pinkish within.



with S.L. Cox ✓ Mar. 2 - Rio Girardot, <sup>affluent of Rio Atrato,</sup> 14 km. s.s.w. of Carmen de Atrato, Choco, 1300 m

L. 21504 Boneria

abundant in pasture

L. 205 Gynandropsis  
along stream

L. 306

marshy place in pasture

L. 707 Gynandropsis  
along stream

L. 608

steep wooded slope, rain forest

L. 209

steep wooded slope, rain forest

with S.L. Cox ✓ Mar. 2 - Ridge bet. Rio Girardot and Quebrada Palestina, <sup>affluent of Rio Atrato,</sup> 10 km. s.s.w. of Carmen de Atrato, Choco  
dense rain forest on ridge

L. 210

L. 411 Piperaceae

L. 112

on tree trunk, rare.

L. 214 Faramea

L. 213

Adffmaria

ascending, flowers white.

malodorous  
bush 2 m. tall, fls. deep orange,  
fruits springing open when  
ripe, <sup>but not dry</sup> valves recurved.  
prostrate, fls. pale violet.

fl. pale salmon  
brittle herb 1 m. tall, fruits  
dehiscing with the valves  
recurving when ripe but not dry.  
erect suffrutescent herb.  
bracts and calyxes deep purple,  
corolla white, fruit blue.  
leaves completely distinct from  
plant ascending.

1400 m. - single stemmed shrub 1 m.  
1500 m. tall, fls. white, fruit rose color,  
fleshy, oblong.  
bushy plant 1.5 m. tall,  
fls. white.  
fls. green with brown center.

shrub 2 m. tall, fls. white,  
fruit green.  
shrub 1.5 m. tall, scrambling,  
fls. pinkish.



L 21515 Psychotria

L 3 16 Faramea

L 7 17

L 1 18

root parasites

L 1 19

L 1 20

root parasites

L 2 21 Vaccinium

ridge top forest

L 1 22

terrestrial

L 1 23

L 1 24 Psychotria

L 4 25 Mesleria

with  
G. L. Cole

Mar. 3 - Confluence of Rio Daura and  
Quebrada Cierro, affluents of Rio  
Habita, 3 km. S.W. of Alto El Plateado, 2325 m.  
6 km. S.W. of Carmen de Atrato, Chirico.

L 11 26

Cinchona pubescens Vahl.  
forest along stream

single stemmed shrub

- 1 m. tall, fls. greenish-white.

- shrub 2 m. tall, fruits dark green.

- shrub 2 m. tall, fls. white.

- fruit green.

- rose-purple.

- shrub, bracts purplish.

- rose color, some smooth.

- outside, others tessellate.

- vine like shrub, bracts

- bright red, some pink.

- fls. dark red-purple.

- vine climbing in trees

- corolla scarlet with yellow

- mouth

- single stemmed herb

- 1 m. tall, fruit white.

- erect shrub 1.5 m. tall,

- flowers bright orange

Anal Bellis	
q+c	0.6
cin	m.m. tr
qui	m.m. tr
TcA	0.6
branches	
q+c	0.6
ci	0.4
qui	m.m. tr
TcA	1.0
leaves	

tree 3 m. tall, 10 cm. thick  
at base, leaves with veins  
prominent beneath, dull  
dark green above, paler  
and more glossy beneath,  
fls. fragrant, red outside,  
pale pink within, hair  
white. (bark samples, one from  
trunk, one from under 7 cm. diam.)



with  
R. L. Cole

Mar. 3 Rio Dauro (e. fork of R. Hábita),  
8 km. w. of s. of Alto El Plateado, 7 km. e. n. e.  
of Carmen de Atrato, Chocó  
patch of bushy woods on  
steep slope.  
21527

L. 21527

L. 6 28 *Cinchona pubescens* Vahl

L. 5 29 *Cinchona pubescens* Vahl

with  
R. L. Cole

Mar. 4 - Alto La Unión, headwaters of  
Rio Dauro (e. fork of Rio Hábita), 6 km.  
s. of Alto El Plateado, 10 km. e. n. e. of  
Carmen de Atrato, Chocó-Antioquia border.  
thick bushy woods on  
n. slope. 2550 m.

L. 2 30 *Phyllanthus*  
along trail, common.

~~2400 m.~~

2400 m.

2400 m.  
Anal. Millis  
q+c m. m. tr.  
cin 0.2  
quin m. m. tr.  
P.C.P. 0.2

2500 m.  
Anal. Millis  
q+c 0.8  
cin traces  
quin m. m. tr.  
P.C.P. 0.8

spreading bushy tree, fls.  
pink, waxy. Cor. grayish,  
leathery.

tree composed of 4 stems,  
sprouts about 10 cm. diam.,  
7 m. tall, ~~leathery~~ leaves  
dull, dark green above,  
paler, sometimes and  
with prominent veins  
beneath, turning red when  
old, fls. fragrant, red  
outside, with pale pink  
within, hairs white.

tree 15 cm. diam., 8 m. tall,  
leaves dark dull green  
above, paler, venulose  
beneath; flowering abundant-  
ly, fls. red without, pale  
pink within, fragrant.

shrub 1 m. tall, young  
growth purplish.



- L. 15 31 *Palicourea*  
 L. 16 32 *Cinchona pubescens* Vahl  
 edge of clearing, in full sun

- L. 1 33 *Liabum*  
 along trail

- L. 2 34 *Liabum*  
 along trail, common

- L. 6 35 *Liabum*  
 common along trail

- 7 36 *Ladenbergia*  
 on ridge

- L. 5 37 *Chusquea*  
 common in forests

- with  
 L. L. Cole  
 Mar. 4 - Rio Daurio near headwaters,  
 7 km. s. of Alto El Plateado,  
 9 km. n. of e. of Carmen de Atrato,  
 Chocó 7450 m.  
 Bank above trail in thin woods.  
 L. 3 38 *Ancinina*

Anal	Pellis
g+c	1.4
lin	0.8
quin	2.2
T.C.A	2.2

- shrub 2 m. tall, scarcely  
 branched, fls. pale lemon yellow.  
 tree 8 m. tall, 15 cm. thick,  
 leaves dull green above,  
 deep purple beneath, flowers  
 red outside, center of lobes  
 pink within, border white  
 with white hairs, very  
 fragrant. (bark sample).  
 tall herb, definitely  
 lactiferous, fls. bright  
 yellow.  
 tall herb, up to 2.5 m., definitely  
 lactiferous, fls. bright  
 chrome yellow.  
 bushy much branched  
 herb, branches pendent,  
 flowers blue-purple.  
 tree 10 cm. thick, 8 m. tall,  
 fls. white, fleshy, fragrant.  
 "aqueeno" (bark sample)  
 forming tangles of arching,  
 scrambling canes, climbing  
 up into trees. Hunting  
 simultaneously throughout  
 region.

tufts



with ✓ Mar. 4 - Rio Sauri 1.5 km  
 c.b. lat. confluence with Rio Tabita,  
 6 km. s.e. of Carmen de Atato, Choco  
 wooded ravine in pasture 2200 m.  
 L. 1539 *Ladenbergia magnifolia*

L. 40 *Viola*

grassy banks above woods

L. 41 *Lycopodium*

grassy banks above woods

L. 42 *Drymaria*

marshy open grassy place

✓ Mar. 4 - e. slope of Alto de Carmen,  
 west side of valley of Rio Tabita,  
 3 km. s.e. of Carmen de Atato, Choco  
 bushy wooded slopes.

L. 10 43 *Cinchona pubescens* Vahl

L. 9 44 *Cinchona pubescens* Vahl

tree 10 m. tall, leaves glossy,  
 fls. white, fragrant "azuceno".  
 creeping, fls. pale violet.

fls. white.

2325 m.  
 Anal Bell's  
 q+c 0.8  
 cin trace  
 quin n.m.k.  
 T.C.A. 0.8

tree 10 cm. diam., 6 m. tall,  
 leaves dull dark green  
 above, paler, red-veined  
 beneath, fls. fragrant, red  
 without, lobes red in center  
 within, white bordered and  
 with white hairs. (bark sample)

2525  
 Anal Bell's  
 q+c n.m.k.  
 cin 0.2  
 quin n.m.k.  
 T.C.A. 0.2

tree 8 cm. diam., 5 m. tall,  
 leaves dull green above,  
 purple beneath, fls.  
 fragrant, red without,  
 pale pink with deeper  
 pink centers within.  
 (bark sample).



with ✓  
c.f. cor

Mar. 4 - summit of Alto de  
Carmen, 2.5 km. s.e. of  
Carmen de Atrato, Chocó  
densely bushy, tangled 2580 m.  
ridge - top forest.

L. 21545 *Lycopodium*  
2  
int. bank above trail  
13 46 *Ladenbergia*

L. 7 47 *Cephaelis axillaris* Sw.

✓ Mar. 4 - quebrada El Lucio,  
above ~~the~~ Carmen de Atrato, Chocó  
bushy wooded slope  
along trail.

L. 5 48 *Gonzalagunia*

3 49 *Labell*

L. 5 50 *Fuchsia*

L. 2 51 *Fuchsia*

trailing, fertile  
- branches erect.  
spreading, much branched  
tree 5 m. tall, flowers  
white, fleshy, very fragrant.  
- slender, unbranched shrub  
2 m. tall, fl. white, fruit blue.

2500 m. arching shrub. 1.5 m. tall.  
fls. coral pink outside, white  
within, fruits white,  
fleshy when ripe.  
- semi-scandent herb  
pendent, flowers scarlet.  
- erect, spreading herb,  
leaves dull, fls. with  
calyx + hypanthium  
dull crimson, petals deep  
purple, erect.  
- weals shrub, fls. scarlet,  
petals flaring.



with  
S. T. Cole  
Mar. 6 - Rio Carmen, 2-3 km. n.  
of Carmen de Atrato, Choco 2160 m.  
banks above trail in cleared valley.  
L. 21552 *Galium hypocarpium*

L. 3 53 *Fuchsia*

L. 1 54

L. 1 55 *Stellaria*

✓ Mar. 6 - Headwaters of Rio Carmen,  
7 km. n. of Carmen de Atrato, Choco.  
partly cleared woods, steep slope  
2675 m.

L. 5 56 *Fuchsia*  
banks above trail

✓ Mar. 6 - same but 3 km. n.  
2850 m.

L. 7 37 *Nertera granadensis*  
common above trail

L. 58 *Fuchsia*  
steep bank above trail

4 59 *Centropogon ferrugineus*  
common

twining in bushes, fruit  
orange, fleshy.  
erect shrub 2 m. tall,  
inflorescences pendent,  
flowers deep crimson  
semi-woody vine.  
fls. white.

erect herb, inflorescences  
drooping, calyx varying  
from greenish-red to crimson,  
corolla from crimson to purple.

prostrate, fls. pale green,  
fruit translucent scarlet.

2900 m. erect herb, ~~flowers~~ <sup>infl.</sup> pendent,  
calyx crimson, corolla purple  
(with #21560 but color not  
intergrading)  
scrambling weak shrub  
corolla deep orange with  
yellow lobes, column white  
anthers blue-gray.



L. 21560

Fuchsia

- 2 61 *Centropogon minimus* McVaugh, n. sp. ined  
common along trail  
62 *Burmeistera*

with  
E.L. Coe.

Mar. 6 - ridge at head of Rio  
Carmen (Alto de la Raza), 10 km.  
n. of Carmen de Atrato, Chocó-Antioquia border.  
bushy woods. 3150 m.

L. 3 63

*Trichomanes*

cut bank above trail.

L. 4 64

*Rhynchospora*

cut bank above trail, common

L. 3 65

*Palicourea*

L. 1 66

along trail

L. 1 67

*Lycopodium*

open place along trail

L. 5 68

*Loranthus*

parasitic

with  
E.L. Coe.

Mar. 6 - quebrada La Fragua, west fork  
headwaters of Rio Pácor, 7 km. w. of  
Alto El Plateado, 33 km. s. of Uracá,  
Antioquia, 3000 m.

erect herb 1 m. tall, infl.  
drooping, calyx & bractlets  
green, ~~corolla~~ corolla red (with  
# 21558 but colors not  
intergrading).

2960 m.

lactiferous herb,  
fls. magenta.  
weak pendent shrub  
hanging over banks above  
trail, 2 m. long. fls. bronze  
green, fruits purple, inflated  
leaves purple beneath.

tufts

shrub 2 m. tall, fruit green.  
forming small cushions.

sterile branches appressed  
to ground, fertile erect.  
basal part of corolla red,  
distal half yellow.

on Antioquia  
side.



dense wet forest, tangled  
with lianas and Clusia

21549 *Centropogon capinoides* Gleason Rued  
along trail

L. 1 70

L. 11 71 *Cinchona pubescens* Vahl

Trunk  
q+c 0.7  
cin. 0.1  
qui m.m. 1.5  
T.C.P. 0.8

L. 5 71a *Palicourea*

✓ *Cauces*

✓ Mar. 7 - w. side of valley of Rio Pabón,  
n.e. of Alto Torqueta, 27 km. s. of  
Urrao, Antioquia 2600-2800 m.  
dense tangled bushy forest  
on east slope.

(Most of *Cinchona pubescens*  
observed was affected by large  
stem cankers).

L. 4 72

L. 10 73 *Cinchona pubescens* Vahl  
scattered throughout woods

L. 10 74 *Cinchona pubescens* Vahl  
scattered throughout woods

Trunk  
q+c 0.9  
cin 0.5  
qui m.m. 1.4  
T.C.P. 1.4

herb, fls. white except  
blue-gray anthers, lobes  
- patent.  
- shrub, m. tall, fruit  
dark red.

Anal Bellis  
Branches  
q+c m.m. 1.5  
cin. 0.3  
qui m.m. 1.5  
T.C.P. 0.3

tree 18 m. tall 20 cm. thick,  
leaves green, a few old  
ones red, (bark samples  
one from trunk, one from  
branch 7 cm. or less in diam.)

(Arenas took his #8, 7 & 2 here.  
I took herbarium specimens  
from them but no bark. His  
nos. are in () with the proper  
specimen collections below)

The *Cinchona* here is  
~~very~~ <sup>more or less</sup> uniform and all  
in flower. It is a narrow  
leaved form of *C. pubescens*  
similar to that around Carmen)

2750 m.

2800 m

Anal Bellis  
Branches  
q+c m.m. 1.5  
cin. 0.2  
qui m.m. 1.5  
T.C.P. 0.2

Trunk  
q+c m.m. 1.5  
cin. 0.4  
qui m.m. 1.5  
T.C.P. 0.4

2800 m

Anal Bellis  
Branches  
q+c 0.8  
cin 0.4  
qui m.m. 1.5  
T.C.P. 1.2

slender shrub, m. tall  
fls. yellowish, mostly in buds.  
tree 20 m. tall, 30 cm. thick,

fls. fragrant, dull red  
without, dull pale pink  
within. (bark samples  
both from trunk & branches  
under 7 cm. diam. separately).

tree 20 m. tall, 25 cm. thick, fls.  
fragrant, dull red without, dull  
pink within, darker in center of lobes  
(bark samples from trunk & branches under 7 cm.)



L 21575 *Chusquea*  
2

L 6 76 *Ladenbergia*  
common in woods

L 3 77  
trunk of tree, epiphytic

L 10 78 *Cinchona pubescens* Vahl

L 7 79 *Cinchona pubescens* Vahl  
open sun in pasture, steep slope.

L 8 80 *Cinchona pubescens* Vahl  
open sun in pasture

with 31

E.L. Cool 82

wooded ravine along river  
*Rondeletia*  
wooded ravine along river

2750 m. forming tangled underbrush  
in forest, fruiting over entire  
region, largest stems  
2 cm. thick.

2750 m. tree 15 m. tall, 20 cm. thick,  
(others seen much larger)  
fls. very fragrant, white,  
lobes fleshy, fruit dry  
"azuceno".

2750 m. small tufts, leaves  
only slightly thick, flowers  
dull dark red or pale maroon.

2700 m. Clumps of grown stumps  
sprouts up to 10 m. tall,  
10 cm. thick, fls. fragrant  
dull red without, lobes pink  
within with white border.  
(Arenas bark sample #2 taken Dec. - Jan.)

2600 m. slender tree 8 m. tall, 10 cm.  
diam. older leaves turning  
red. (narrower leaved  
*C. pubescens* I have seen)  
(Arenas bark sample #3 taken Dec. - Jan.)

2600 m. tree 8 m. tall, 15 cm. diam.  
older leaves turning reddish,  
fls. dull red outside, pink  
within but lobes with a  
white margin. (Arenas  
bark sample #7, taken Dec. - Jan.)

shrub 4 m. tall, infl.  
erect fls. yellow.  
erect shrub 3 m. tall,  
corolla tube coral-red,  
lobes pink



L 1583 *Billia colombiana* P.  
edge of clearing

L 684 *Cinchona pubescens* Vahl  
edge of clearing

✓ Mar. 8 - Headwaters of Rio  
Pabon, north of Alto de la Raya,  
Antioquia 2800 m.

85 *Centropogon carpinoides* Gleason Rued.  
along trail in wet forest

✓ Mar. 10 - highest part of  
highway, about 4 km. s. of  
Don Matias, Antioquia  
scrubby forest very bushy 2400 m.  
undergrowth tangled with  
vines

L 11 86 *Ladenbergia*

L 2 87 *Palicourea*

spreading tree 6 m. tall,  
fls. white with yellow  
center, fruits immature.  
tree 12 m. tall, 15 cm. thick  
leaves green, unusually  
thick and coarse, flowers  
fragrant, dull red  
without, pink within,  
lobes with whitish borders  
and hair. (bark sample).

Anal Bellis

g.c.	1.2
cm	0.3
quin	n.m. to
T.C.A.	1.5

{trunk

herb 1 m. tall, branched at  
base, fls. white with  
dark gray anthers, corolla  
irregularly salverform.

tree 8 m. tall, 15 cm. thick,  
leaves revolute, flowers  
white, fleshy, very fragrant  
with a heavy gardenia-like  
odor.

unbranched shrub 1 m.  
tall, infl. yellow,  
immature fruit black.



- L. 71588 *Cinchona pubescens* Vahl  
almost covered by vines

Mar. 11 - s. ridge of valley of  
Rio Nechi, 10 km. e. of Yarumal

Mar. 11 - country for 20-25 km  
n. of Santa Rosa, Antioquia,  
along highway, is a rolling,  
somewhat dissected plateau  
between 2900 + 3100 m. alt. The  
southern end, around  
Santa Rosa and north, is  
completely deforested and

✓ Mar. 11 - south ridge of  
valley of Rio Nechi, 10 km.  
s. of Yarumal, Antioquia.  
bushy wooded slope 2960 m. ~~2500 m.~~

- L. 4 89 *Palicourea*

- L. 3 90 *Nertera granadensis*

- L. 2 91 *Palicourea* open grassy places along road

- L. 3 92 *Palicourea*

- L. 2 93 *Palicourea*

small leaning tree 5 m.  
tall, 6 cm. thick, sterile,  
leaves dull green  
above, purple beneath.  
(bark sample).

rather badly eroded.  
To the north appear patches  
of woods, almost  
solid *Quercus humboldtii*.  
This was evidently the  
dominant tree at these  
altitudes before deforestation  
occurred.

No *Cinchona* observed at  
this altitude, although  
*sterile Ladenbergia* was  
present.

- shrub, veins red-purple  
beneath, white above,  
flowers rose purple, lighter  
without, short-styled.  
prostrate, mat-forming,  
- fruit scarlet.
- shrub 2 m. tall, fls.  
dull yellow, turning purplish.
- shrub 2 m. tall, fls.  
rose-purple, short-styled.
- shrub 3 m. tall, fls. dull  
yellow, turning purplish.



L. 21594 *Palicourea*  
4

L. 4 95 *Psychotria*

✓ Mar. 11 - Valley of Rio Nechí  
6 km. s. of Yammal, Antioquia  
brushy second-growth slope 2550 m.  
L. 4 96 *Cinchona pubescens* Vahl  
uncommon

L. 3 97 *Saranga*  
one bush seen

✓ Mar. 11 - south side of valley of  
Quebrada Santa Rita, half-way between  
Yammal and Angostura, Antioquia  
pastured north slope with  
scattered small trees 2260 m.  
L. 9 98 *Cinchona pubescens* Vahl  
along road

L. 7 99 *Cinchona pubescens* Vahl

shrub 2 m. tall, attached  
by a fungus, fls. rose-  
purple, lighter without,  
- long-styled.  
slender shrub 2 m. tall,  
flowers white.

sterile sprout 3 m. tall,  
3 cm. thick, leaves dull,  
- turning red when old.  
shrub 3 m. tall, flowers  
white.

leaf margins  
and veins  
revolute  
toward base  
A peculiar form of *C. pubescens*  
here, with short fruits and  
with the outer layer of bark  
peeling as in *Remigia pedunculata*,  
bright red flowers. "azules colorado"  
shrub 3 m. tall, leaves  
red-veined beneath, turning  
red with age, flowers  
red without, deep pink  
within but lobes with  
white borders and hairs, rather  
- fragrant.

Anal. Bell's  
Q+C m. m. m.  
Cm 0.2  
Qm m. m. m.  
T.C.F. 0.2

small tree, 7 m. tall, 10 cm.  
thick, leaves purple beneath  
with deep red veins, flowers  
somewhat fragrant, red without,  
pink center, white border within,  
immature fruits red. (bark sample ?)



L 21600 *Cinchona pubescens* Vahl

L 2 01 *Cinchona pubescens* Vahl

L 4 02 *Cinchona pubescens* Vahl

✓ Mar. 11 - Angostura, Antioquia  
(just outside town)  
in ravine filled with huge  
granite boulders. 2000 m.

L 3 03

L 3 04 *Vismia*  
abundant, weedy

L 11 05 *Cinchona pubescens* Vahl

stump sprout 3 m. tall,  
leaves red-veined, turning  
red, immature fruit red.

stump sprout 3 m. tall,  
leaves red-veined, turning  
red with age, immature  
fruit red.

Anal. Bellis  
Q+R 0.3  
W 0.3  
Q+R 0.3

stump sprout 5 m. tall,  
5 cm. thick, leaves red-veined,  
becoming purplish beneath,  
fls. red without, red within  
except narrow white border  
and hair on lobes, somewhat  
fragrant, immature fruit  
reddish green.

Same form of *C. pubescens* here  
as above. Have harvested 9 tons  
of bark.

tree 5 m. tall, 7 cm. thick, bark  
warty, with exudations  
of <sup>clear</sup> resin which burns with  
an aromatic odor. "pata gallina".

tree 7 m. tall, with orange  
latex which is said to  
color fabrics with a fast color  
"carate colorado".

stump sprout 6 m. tall,  
5 cm. thick, leaves enormous,  
purplish beneath, red veined,  
fls. somewhat fragrant,  
red without, red center within  
white borders + hairs on lobes.



✓ Mar. 12 - Angostura, Antioquia  
pastures just above town.

2100 m.

L. 21606 *Ranunculus*

2

grassy slope

L. 4 07

*Eupatorium*

common in pastures and fence rows

L. 3 08 *Acalypha*

fence row, in sun.

L. 4 09

*Tournefortia*

brushy fence row

L. 3 10

*Boehmeria*

brushy fence row, common

L. 4 11

*Acalypha*

brushy fence row, shaded

L. 2 12

*Cestrum*

grassy slope

L. 5 13

brushy fence row

L. 4 14

*Piper*

brushy fence row

L. 5 15

*Rubus*

brushy fence row

L. 4 16

brushy fence-row

L. 3 17

*Tournefortia*

brushy fence row

petals bright yellow

~~erect~~ erect herb 1.5 m. tall,  
fls. white, fragrant;  
~~believed to produce "wches"~~  
or spin-worms in cattle.  
"salvia". considered a serious weed.  
erect shrub 2 m. tall.

shrub 3 m. tall, spreading,  
tangled, fls. white.  
shrub 2 m. tall, spikes  
pendent.

shrub 2 m. tall, styles  
pinkish.  
erect shrub 2 m. tall,  
fruit green.

vine climbing in bushes,  
woody, fls. white.  
shrub 3 m. tall, with  
balsam-like odor when  
broken, spikes erect.

canes scrambling through  
bushes, no proper "primocanes"  
seen, flowers white, fruits  
black when ripe, sweetish  
but without much flavor.

erect shrub 2 m. tall,  
fls. white, fruit purple.  
tangled shrub, flowers  
white



- L. 1618 *Nephrolepis*  
earth, banks, common
- L. 19 *Baccharis*  
brushy fence row
- L. 20 *Borreria*  
shaded in brushy fence row
- L. 21 *Stachytarpheta*  
brushy fence row
- L. 22 *Borreria*  
edge of brushy ravine
- L. 23 *Myrsine*  
edge of brushy ravine
- L. 24 *Tournefortia*  
edge of brushy ravine
- L. 25  
brushy slope
- L. 26 *Gaultheria*  
brushy slope
- L. 27 *Vaccinium*  
brushy slope, common
- L. 28 *Cinchona pubescens* Vahl  
brushy fence row
- L. 29 *Coccyzium*  
shaded bank

2150m

erect

shrub 3 m. tall, tangled,  
heads white.  
fls. white.

suffrutescent herb 1 m.  
tall, fls. blue-lavender.  
shrub 1.5 m. tall, leaves  
glaucous beneath, fls.  
pink, petals spreading.  
small tree 4 m. tall,  
fruit black.  
shrub 1 m. tall (others  
nearly attain tree dimensions)  
fls. white, leaves glossy.

woody vine climbing in  
bushes, wings of fruit red.  
shrub 2 m. tall, fls.  
pink, ripe fruit black,  
eaten by small boys. "uva"  
tangled weedy shrub,  
leaves glossy, bracts  
deep purple, corollae  
deep purple with white  
apex.

small tree 4 m. tall, com.  
thick, ~~no~~ leaves with  
reddish veins, immature  
fruit reddish, "azulescens"  
(bark sample)  
prostrate, fruit blue,  
fleshy.



L 216 30 *...*  
base of hill in forest

L 2 31 *Coccoloba*  
shaded area

L 32 *...*  
bushy fence row  
sunny slope

L 33 *Coccoloba*  
sunny slope

El Salto, on  
Mar. 13 - ridge bet. quebrada las  
Calles and quebradona, 10 km. s.w.  
of Angostura, Antioquia  
thicket in pasture 2475 m.

~~34~~  
L 10 34 *Cinchona pubescens* Vahl

Mar. 13 - Ridge between quebradona  
and Rio Concepcion, on side facing  
quebradona, 13 km. s.w. of  
Angostura, Antioquia  
very bushy, decadent  
forest, on slope. 2650 m.

L 35 *Psychotria*  
edge of clearing

fruit dull lavender, fleshy

prostrate, fleshy  
fruit dull blue  
small tree 5 m. tall,  
acorn-like fruit immature.  
prostrate, fruits bright  
blue.

above 2400 m. in this general  
region is a pubescent form of  
*C. pubescens* which apparently  
completely replaces the almost  
glabrous form found below.  
small tree 3 m. tall, 3 cm thick,  
flowers fragrant, red without,  
pink within (bark sample)  
(tree had stem cankers, "agucero Colorado")

(all seen  
had stem  
cankers)  
*C. pubescens* common here,  
the pubescent form mentioned  
above. This forest was  
almost destroyed by a  
hail storm 20 days ago.  
The trees were almost  
entirely stripped of leaves.  
4 calves were killed, and  
the people report that all  
the birds were killed. They  
report hail-stones were  
a bit, but this must be exaggerated.  
slender shrub 2.5 m. tall,  
fruit green.



L 21636 *Cinchona pubescens* Vahl  
in forest

L 4 37 *Cinchona pubescens* Vahl  
in forest

L 2 38 *Cinchona pubescens* Vahl  
edge of clearing

L 39 ~~edge~~  
edge of clearing, common

L 2 40 *Ladenbergia magnifolia*  
edge of clearing, only no seen

L 3 41 ~~edge~~  
edge of clearing, common

L 2 42 *Coccoloba*  
edge of clearing

12 ~~142~~ Mar. 13 - Quehadoma, 12 km.  
s.w. of Angostura, Antioquia  
edge of forest, dense 2475 m.  
with brush, Chusquea and vines.

L 8 43 *Ladenbergia undata*

L 3 44 *Drammilia subcapillaris* (Desv.) Morton  
~~epiphytic on tree trunk~~ det. Lellinger 1971  
epiphytic on tree trunk

L 1 45 ~~epiphytic on tree trunk~~  
epiphytic on tree trunk

Anal. Bellis

q+c n.m. tr  
ci 0.4  
qui n.m. tr  
f.c. 0.4

Anal. Bellis

q+c n.m. tr  
ci 0.3  
qui n.m. tr  
f.c. 0.3

Anal. Bellis

q+c n.m. tr  
ci 0.3  
qui n.m. tr  
f.c. 0.3

tree 20 m. tall, 30 cm. thick,  
leaves dull, badly  
damaged by hail. (3 bark  
samples, one from trunk, one  
from branch 7 cm. thick, one from  
branch 4 cm. thick) "azuena Colorado"

tree 10 m. tall, 15 cm. thick.  
leaves dull, badly damaged  
by hail. buds deep coral pink.  
(bark sample) "azuena Colorado"

sterile tree 5 m. tall, 5 cm. thick,  
leaves dull green, damaged  
by hail. (bark sample) "azuena Colorado"  
small tree 4 m. tall (others  
much larger), stipules  
pale green.  
sterile tree 6 m. tall.

tree 8 m. tall, in bud only,  
stipules pale green  
prostrate, fls. lavender,  
fruit bright blue, fleshy.

tree 12 m. tall, 15 cm. thick,  
flowers white, fleshy,  
very fragrant with a  
gardenia-like odor.  
pale green

leaves somewhat thick, flowers  
pale maroon red.



- ✓ Mar. 14 - 4 km. s.e. of Hoyo Rico,  
11 km s.e. of Santa Rosa, Antioquia  
cleared land with sparse  
second growth brush, on  
side of ravine 2850 m.  
L 21646 *Cinchona officinalis* L.

- L 47 *Dioscorea*  
climbing in *Cinchona* tree

- ✓ Mar. 14 - "Leticia", s. end of Alta  
Buena Vista, 10 km. s.s.w. of  
Yarumal, Antioquia 2900 m.  
L 24 48 *Cinchona officinalis* L.  
side of wooded ravine

- Valley of Quebrada Tobon  
✓ Mar. 14 - 5 km. n.n.w. of Yarumal  
on road to Valdivia, Antioquia  
steep brushy slope 2775 m.  
L 10 49 *Cinchona pubescens* X *officinalis*

Anal. Mellis				
q. + c.	m.	m.	m.	tr.
cin		0.6		
quin	m.	m.	m.	tr.
T.C.P.		0.6		

small tree 5 m. tall, 7 cm.  
thick, leaves sub-glossy  
above, with reddish veins,  
turning reddish with age,  
fls. clear maroon, with  
white hairs, fruits red  
when immature.

(bark sample).  
vine climbing in tree,  
fls. greenish yellow.

tree 12 m. tall, 20 cm. thick,  
fls. maroon with white  
hairs. leaves with red  
midrib, sub-glossy above,  
tending to have revolute  
margins. (bark sample).

seems to be considerable hybrid-  
ization here between *C. pubescens*  
and *C. officinalis*.

Anal. Mellis				
q. + c.	m.	m.	m.	tr.
cin		0.8		
quin	m.	m.	m.	tr.
T.C.P.		0.8		

tree 5 m. tall, 6 cm. thick,  
older leaves with veins  
reddish, upper surface  
glossy, fls. <sup>somewhat fragrant</sup> red without,  
deep pink within, lobes with  
narrow white border + hair (bark sample)



L 21650 *Cinchona officinalis* L.

L.1 51 *Galium hypocarpium*  
vertical bank in road cut

L.7 52 *Cinchona pubescens* Vahl  
common

L.2 53 *Meritena granadensis*  
vertical bank in road cut

L.6 54 *Cinchona pubescens* Vahl  
common

~~55 *Palicourea*~~

Mar. 14 - 3 km. n. w. of Yacumal  
on top of plateau bet. Yacumal  
and Guachada. Obón, on road  
to Valdivia, Antioquia.  
remnants of second growth 7800 m.  
in ravines and on ridges  
in pasture.

L.1 55 *Palicourea*  
on top of ridge

L.3 56 *Plinia*  
on top of ridge

Anal. Bellis

g+c	m.m. in
cin	0.7
quin	m.m. in
T.C.A	0.7

small sterile tree, 4 m.  
tall, 3 cm. thick, leaves  
sub-glossy, margins  
revolute. (bark sample)  
fruit fleshy, orange

small tree 5 m. tall, 5 cm. diam.,  
leaves dull, turning reddish  
with age, especially  
the veins, fls. red without,  
pink within, some with  
white border and hair.  
fragrant. (bark sample).  
prostrate, fruit orange,  
fleshy.

small tree 5 m. tall,  
5 cm. diam. leaves dull  
turning reddish with  
age, flowers red without,  
pale pink within  
fragrant. (bark sample)

*C. pubescens* apparently  
hybridizes here with  
*C. officinalis*.

shrub 2 m. tall, infl.  
and flowers deep purple.  
small shrubby tree,  
leaves stiff, white beneath,  
fls. yellowish green.



L 21657 *Guettarda* sp.  
common on ridge top

L 17 58 *Cinchona officinalis* L.  
rare on ridge top

L 5 59 *Cinchona pubescens* (X *officinalis*?)  
ravine

L 8 60 *Cinchona pubescens* X *officinalis*  
ravine

3 61 *Centropogon ferrugineus*  
shade in ravine, common

L 8 62 *Cinchona pubescens* X *officinalis*  
ravine

Mar. 15 - saddle bet. Alto San Miguel and Alto Alegrias, 15 km. s.s.e. of Caldas, Antioquia 2800 m.  
Thickets along road near houses

L 6 63 *Fuchsia*

small tree 4 m. tall, flowers with bronzed tube and thick part of lobes, margins of lobes white and crisp.

Anal Mellis	
g+c	n.m. vi
lin	0.4
quin	n.m. vi
T.C.B.	0.4

tree 6 m. tall, 3 cm. thick, (really a sprout from a somewhat larger stump partly rotted away) leaves sub-glossy above, margins revolute, flowers maroon with white hair. (bark sample).

sterile sapling 3 m. tall, leaves green.

sterile sapling 4 m. tall, leaves green (bark sample) scrambling, semi-scandent shrub, flowers orange-scarlet with yellow lobes, anthers black, column white, becoming black distally.

sterile sapling 4 m. tall, leaves with reddish midrib (bark sample)

shrub 4 m. tall, forming a dense thicket, lower stems 5-8 cm. thick, tangled, inflorescence pendent, flowers deep crimson-red, fruit fleshy.



↓ Mar. 15 - headwaters of  
Rio Medellin, just n.e. of  
Alto San Miguel, 12 km.  
s.e. of Caldas, Antioquia  
bushy ravine 2550-2580 m.

L 21664 *Cinchona pubescens* Vahl  
edge of ravine, common in  
second growth

L 65 *Ladenbergia magnifolia*

L 66 *Dioscorea*

L 67 *Besleria*  
in underbrush

L 68  
in underbrush

L 69 *Helaginella*  
common in shade

*Cinchona pubescens* sprouts  
and small trees occur  
commonly in the brush and  
second growth along the road  
from 2325 to 2800 m. alt.

2580 m.  
Anal Bellis  
q+c n.m. 6  
cin 0.5  
qui n.m. 5  
t.c.p. 0.5

tree 4 m. tall, largely of  
stump sprouts from  
a stump 20 cm. in diam.  
whole tree with a ~~very~~ dark  
purplish cast, fls. very  
fragrant, dull red  
without, pink ~~red~~ within,  
deeper at center of lobes.  
(bark sample from stump).  
tree 15 m. tall, 30 cm. thick,  
flowers white, disagreeably  
fragrant.

~~vine~~ herbaceous vine, clim-  
bing in trees, leaves stiff,  
dull and rugulose above,  
fls. yellowish green.  
shrub 1.5 m. tall, flowers  
orange.

vine climbing on shrubs,  
enlarged portion of corolla  
bright violet constricted  
part white, lobes pale  
green with purple-black  
markings within, flowers  
erect.  
erect or ascending.



✓ Mar. 16 - 7 km. s.w. of Rio  
Lucio, Caldas 2475 m.  
open pasture  
L21670 *Cinchona pubescens* Vahl  
14

✓ Mar. 16 - 1 km. n. of San  
Clemente, 12 km. n. of Anserma,  
Caldas ~~2475~~ 2200 m.  
wooded ridge-top, bushy  
and tangled with *Rubus*.

L3 71 *Asplenium*  
epiphytic on tree trunk

L1 72 *C. lach.*  
epiphytic on tree trunk

L3 73 *Sarcocolla*

L1 74 *Rubus*

L5 75 *Rubus*

tree 8 m. tall, 15 cm. thick,  
leaves dull green, veins  
reddish beneath, fls.  
red without, pale  
pink within, fragrant.  
(bark sample)

*C. pubescens* common  
for some miles along  
the summit of this  
series of ridges.

fls. bronze-maroon

tree 5 m. tall, pubescence  
harsh, whitish, leaves  
pale beneath, fls.  
white with yellow stamens.  
tangled thicket, canes  
slender, white, leaves  
white beneath, fruit  
dark red when ripe, sweet-  
sour, with good flavor.  
tangled thicket, canes  
green, leaves gray beneath,  
fls. pale pinkish,  
fruit black when  
ripe, sweet but with  
a poor flavor.



L. 21676 *Cinchona pubescens* Vahl  
common

✓ Mar. 16 - Between Las Delgaditas  
and Brasili, near km. 50  
on road from Manizales  
to Honda about 13 km. n.w.  
of Ierveo, Tolima 3300 m.  
brushy slope, disturbed  
by road work.

L. 1 77 *Palicourea*

L. 2 78 *Ribes*

L. 3 79 *Fuchsia*  
common

5 80 *Bursera*?  
common

Anal. Pelles

g+c	n.m.t.
Cin	1.9
qui	n.m.t.
P.C.A	1.9

stump 20 cm. thick  
with grown sprouts  
8 m tall, 7 cm. thick.  
leaves dull green, veins  
reddish beneath, leaves  
turning red with age,  
flowers fragrant, red  
without, pale pink  
within, immature  
fruits bronze-reddish.  
(bark samples from trunk  
and sprouts separate) C

- shrub 0.8 m. tall, fruit green.  
- slender arching shrub  
1 m. tall, fls. red,  
fruit immature.  
- shrub up to 2 m. tall  
- fls. pendent, scarlet,  
lactiferous shrub up  
to 2 m. tall, sparsely  
branched, fls. greenish  
with bronzed ~~edges~~ as  
ovary and corolla lobes,  
hair on anthers dull  
golden, fls. with strong  
mercaptan odor, fruit green!



✓ Mar. 16 - just east of  
Aguadita, 3 km. n.e. of  
Fresno, Talima 2325 m.

- L. 2 1681 *Cinchona pubescens* Vahl  
bushy steep slope

✓ Mar. 17 - near La Sierra,  
(near km. 80 on road from  
Bogotá to Cambray) 21 km. n. of  
Facatativa, Cundinamarca  
2200 m

- L. 32 *Cinchona pubescens* Vahl  
in patch of second growth  
on steep slope

70 ✓ Mar. 19, - Paramo de Guasca,  
8 km. e. of Guasca, Cundinamarca  
ridge above tree-line, 3500 - 3600 m.  
grassy with cross ridges of  
limestone, bush patches  
especially in sheltered  
places and on these ridges.

- L. 4 83 *Puya*  
occasional on ridge tops

- L. 5 84 *Paepalanthus*  
common

- L. 7 85 *Puya*  
occasional

*Alphagnum*  
common in  
wet places.

Anal Bellis  
g+c n.m. tr  
li 1.0  
qui n.m. tr  
T.C.A 1.0

tree 14 m. tall, 25 cm. thick,  
leaves dull green with  
veins red beneath,  
fls. fragrant, red  
without, pale pink  
within. (bark sample) □

Anal Bellis  
g+c n.m. tr  
li 1.0  
qui n.m. tr  
T.C.A 1.0

tree 7 m. tall, 10 cm. thick,  
leaves dull green  
with reddish veins,  
fls. fragrant, pink.  
(bark sample)

caespitose, scape 1 m. tall,  
fls. dull bronze-purple,  
forming compact grayish  
cushions.

caespitose, forming patches, scape  
0.8 m. tall, fls. pale green.



- L. 21685a *Weinmannia*  
ridge top
- L. 2 86 *Polypodium*  
limestone ledges and crevices
- L. 1 87 *Geranium*  
common
- L. 6 88 *Aragoa*  
common on ridges
- L. 5 89  
rocky slopes
- L. 1 90 *Galium hypocarpium*
- L. 3 91 *Sp.*  
rocky slopes
- L. 1 92 *Lisimachium*  
rock ledges, rare
- L. 4 93 *Lycopodium*  
under bushes
- L. 3 94 *Berberis*
- L. 2 95 *Bomarea*  
under bushes
- L. 3 96 *Hedyotis*  
common on ridges
- L. 4 97 *Thibaudia*  
common on ridges
- L. 98 *Hedyotis*  
common on ridges

prostrate shrub between  
rocks (one seen 1 m. tall  
and more or less erect).

prostrate, fls. bright  
- rose without, white within.  
- shrub up to 1 m. tall,  
- fls. white.  
- fls. pale lemon yellow,  
- inflorescence nodding.  
- vine-like, fruits  
- orange, fleshy.  
- oily odor when broken  
- fruit immature  
- erect, large clump.

- erect shrub, flowers orange  
- fls. scarlet with green  
- tips to petals, green anthers.  
- rounded shrub, 1 m. tall,  
- young stems yellow,  
- under side of leaves  
- yellow, fls. white,  
- buds pinkish without.  
- erect shrub 1 m. tall,  
- fls. red.  
- rounded shrub 1 m. tall,  
- young stems yellow,  
- under side of leaves yellow,  
- flowers white, buds  
- pinkish without.



- L<sub>2</sub> 1699 *Senecio*  
occasional on ridges
- L<sub>2</sub> 1700 *Rubus*  
common in bush on ridges
- L<sub>1</sub> 01 *Pernettya*  
occasional in open spots  
on ridges
- L<sub>3</sub> 02 *Rhizocephalum*  
grassy patches, locally common
- L<sub>3</sub> 03 ~~*Blagayella*~~ *Lycopodium*  
open grassy slopes, rare

with  
M.C. Farwell  
to get  
set.

✓ April 4 - just north of  
Tocancipá, Cundinamarca  
(bet. Tocancipá and Gachancipá)

L<sub>4</sub> 04 *Salix humboldtii*  
roadside

✓ April 4 - Frutillar, 5 km. S. of  
Padua, Boyaca  
sub-paramo 3000 m.

- L<sub>2</sub> 05 *Galium hybocarpium*
- L<sub>3</sub> 06 *Hedyotis nitida*

✓ April 4 - Paipa, Boyaca  
ditch in salt flat

L<sub>10</sub> 07 *Ruppia maritima* L.  
very abundant

2575 m

bush up to 1 m. tall,  
heads yellowish.  
single stems 0.5 m. tall,  
fls. pink.

prostrate, ripe fruit  
black, under side of  
leaves purple.

corolla tube yellow, lobes  
white, inside of throat  
red-punctate, anthers  
black.

compact clumps, dull  
slightly grayish green.

diffuse tree note staminate  
& pistillate fls. in same spike.

fruits orange, roots yellow  
shrub 0.7 m. tall, fls. white,  
purplish without

podogyne very easily  
deciduous when mature,  
fruiting peduncle slender.



88

~~Colombia~~ 1944 - Colombia  
 Paramo de ~~Guantica~~ Consuelo.

✓ April 5 - s.e. slope of Cordillera  
 de Consuelo, headwaters  
 of Rio Guina, 20 km. n.e. of  
 Belén, Boyacá 3475 m.  
 páramo with scattered huge  
 boulders.

L. 21708 Aragoa

L. 3 09 Senecio

L. 4 10 Baccharis

L. 10 11 Hedyotis nitida

L. 3 12 Vaccinium

L. 6 13 Weinmannia

L. 4 14

between rocks

L. 1 15 Vaccinium

L. 4 16 Apium

Boyacá

89

A tall and one or two aculeate  
 species of *Epipactis*, the former  
 extremely abundant.  
*Sphagnum* common in wet  
 places.

gray-green shrub up to 0.8 m. tall,  
 flowers four-parted, white.  
 shrub, ~~much branched~~  
 at many stems, 1 m. tall,  
 fls. yellow. leaves  
 thick.

small shrub, fls. whitish.  
 prostrate shrub, appressed  
 against rocks, fls. purplish  
 without, white within,  
 leaves with whitish  
 line beneath.

colonies about 1 m. wide,  
 3 dm. tall, buds bright  
 red, fls. pink, leaves  
 stiff, pale beneath.

tree with rounded crown,  
 5 m. tall, 20 cm. thick,  
 fruits red.

dense cushions.

dense cushions, fls. pink.  
 oily odor, fls. white.



April 5 - Banks of Rio Susacón,  
14 km. s.w. of Susacón, Boyacá  
flat grassy river bank 3350 m.

L. 21717

L. 2 18 *Mel.*

L. 2 19 *Mimulus*  
mud at edge of river

L. 3 20 *Hedyotis*  
abundant

L. 2 21 *Pernettya*

L. 1 22 *Nertera granadensis*

with  
N. C. Fassett  
April 7 - Cicuta, Rio Pamplonita,  
Norte de Santander 370 m.  
flat dry stony place, thorn  
forest dominated by *Prosopis*,  
~~many~~ *Opuntia*, etc.

L. 23 *Prosopis*  
dominant

L. 24 *Leg.*

very prostrate, fls. white  
within, with purple  
stripes without.  
- leaves closely appressed to  
ground, fls. white.  
- ~~fls.~~ tangled clumps,  
~~fls.~~ stems succulent,  
fls. bright yellow.  
- dense cushions, fls.  
crimson-purple.  
- buds reddish, fls. white,  
fruit black.  
- prostrate, fruit red,  
fleshy.

conspicuously flat-topped  
tree, 2 m. tall, trunk 15 cm.  
thick, fls. yellowish,  
fruit immature.  
- tree, almost leafless at  
this season, fls. bright purple.



with  
M.C. Parrott

Apr. 8 - Hacienda Landeris (part of  
Hac. San Roque), quebrada  
Rincito, headwaters of Rio  
Peralonso, <sup>6 km.</sup> n. w. of Gamalote,  
w. of Cicuta, Norte de Santander  
steep slope, rather 2300-2400 m.  
dry woods (at least at this  
season), (not a rain forest)

L.  
21725  
14

*Cinchona officinalis* L. var. Q4C - 3.1  
open pasture, common.

Qa: 2.3  
Col: 0.8  
Cin - 1.2  
Gini - 1.0  
T.C.A - 4.3  
(9504) - 3.1

L. 26 *Cinchona officinalis* L. var.  
open pasture, common

L. 27 *Columnea*  
thick woods

L. 28 *Psychotria*  
thick woods

L. 29 *Piper*  
edge of woods

L. 30 *Cinchona officinalis* L. var.  
common in open pasture

L. 31 *Podocarpus*  
one tree seen in thick forest

*C. officinalis*, common in an  
open pasture, small trees,  
a few meters apart, heavily  
fruiting and in bud, few flowers,  
very uniform. ~~side view.~~

2300 m.

small tree, 4 m. tall, 7 cm.  
thick, fls. very dark purple  
with white hairs. (bark sample).  
stipules green slightly  
paler than leaves. Leaves  
rather dull green, scarcely  
any tendency to turn red.  
small tree

2300 m.

vine climbing in lower  
story in forest, flowers  
pendent, orange stems  
+ petioles purplish. <sup>veins impressed</sup> above.  
erect, unbranched, 1 m.  
tall, fls. greenish white.  
shrub 1.5 m. tall, leaves  
rugose, pale beneath.  
aromatic when broken.

2400 m.

2400 m.

2350 m.

small tree 4 m. tall,  
leaves dull dark  
green, fls. very dark  
purple with white hairs.

tree 10 m. tall, 15 cm. thick, branches  
conspicuously whorled. tree sterile.



- L<sub>1</sub> 32 *Cinchona officinalis* L. var.  
common in open pasture

L<sub>1</sub> 33

one seen in thick forest

- L<sub>4</sub> 34 *Cinchona officinalis*  
rare in thick forest  
(no large trees seen in forest except  
one which had been cut).

- with  
n.c.f. ✓ April 8 - 5 km. n.w. of Gramalote,  
w. of Cicuta, Norte de Santander  
L<sub>1</sub> 35 *Cinchona pubescens* Vahl.  
strip of woods on steep side  
of ridge, common 2000 m.

- ✓ April 10 - La Cueva, Quebrada  
Babilonia, affluent of r. Aguas  
Blancas (cf. castro), affluent of Rio Arboledas,  
13 km. w. s.w. of Arboledas,  
Norte de Santander

- L<sub>2</sub> 36 wooded ravine 1600 m.  
*Impatiens* ~~sp.~~  
growing spontaneously around  
house.

- L<sub>1</sub> 37 *Cinchona pubescens* Vahl  
occasional in woods  
in ravine.

- 2350 m. small tree 4 m. tall, leaves  
dull, rather dark green,  
veins reddish,  
fls. very dark purple  
with white hair.

- 2400 m. fls. pale lavender.

- 2400 m. sterile sprout 2.5 m. tall,  
leaves thin, light green.

*C. pub.* common bet. 1800 + 2000 m.  
in second growth + in open.

tree 10 m. tall 25 cm. diam.  
fls. pink, fragrant,  
leaves with red veins.  
(bark sample)

herb, many <sup>thick</sup> stems from  
rot crown, flowers  
bright coral pink.  
(in Antioquia commonly  
called "bezo".)  
clump of stump sprouts  
5 m. tall, 6 cm. thick,  
flowers pale pink,  
very fragrant  
(bark sample)



96

1944 - Colombia

- L 21738 *Myrsine*  
edge of clearing  
L 5 39 *Mavetia*  
edge of thicket

April 11 - upper quebrada  
Babilonia, affluent of quebrada  
Aguila Blanca (Q. Castro), affluent  
of Rio Arboledas, 15 km. w.s.w.  
of Arboledas, Norte de Santander  
in and around clearing in  
rain forest on <sup>steep</sup> S. slope 2400 m.

- L 5 40 *Cinchona officinalis* L.  
open pasture

- L 1 41 *Mavetia*  
thick forest, common

- 42 ~~*Chusquea*~~  
~~common in thick forest~~

- 42 *Lippocampylus*  
edge of forest

- L 4 43 ~~*Miconia*~~ *Miconia* 2500 m.  
small clearing on ridge-top

- L 1 44 *Cephaelis axillaris*  
dense rain-forest

- L 2 45 *Cinchona officinalis* L.  
dense rain forest

- L 9 46 *Cinchona officinalis* L.  
shallow ravine in pasture

Norte de Santander 97

small tree 3 m. tall  
vine climbing in  
bushes, flowers scarlet.

collected  
seeds, many  
from several  
trees, some from  
young trees  
in open  
area

*C. officinalis* scattered  
in pasture, small trees  
about 4-5 m. tall, seedlings  
abundant in forest but  
no large trees seen.  
Veins 5-7 on a side, otherwise  
as in the Gramalote form.  
sterile tree 5 m. tall.

clumps, "hoja larga":

High arching canes,  
emerging from ground  
both scattered and  
several together, mostly  
in fruit and up to 4 cm. thick,  
with #21743. "servitana"  
semi-scandent shrub,  
flowers scarlet.  
shrub 2 m. tall,

shrub 1 m. tall, fls. white,  
fruit blue, fleshy.  
seedling 1.5 m. tall, sterile.

small tree 6 m. tall, leaves  
green, turning red when  
old, fls. deep purple with  
white hair.



- L. 21747 *Cinchona officinalis* L. 1  
shallow ravine in pasture
- L. 7 48 *Cinchona officinalis* L. 1  
open pasture

Q+C = 5.6  
Cin = 1.9  
Quin = 4.6  
T.C.A. = 7.5  
Q504 = 1.1

Qa = 0.8  
Cd = 4.8

Qa = 3.7  
Cd = 3.2

- L. 3 49 *Trichomanes*  
dense forest, steep slope
- L. 4 50 *Cinchona officinalis* L.  
dense forest, ridge top
- L. 1 51 *Pisonia*  
dense forest

with  
M.C. Jassett April 12 Valley of  
Rio Pamplonita, 15  
km. S. of Cucuta, Norte de Santander  
valley bottom with alt. 650 m.  
stony flats of tall grass (*Panicum*  
*maximum*?), and scattered  
bush.

- L. 5 52 *Pisonia*  
common

- L. 3 53 *Croton*  
common

- L. 5 54 *Aporosa*

- L. 3 55 *Acalypha*  
common

- L. 3 56 *Crotalaria*  
roadside

- L. 1 57 *Pisonia*  
climbing on fence along road

Q+C 6.9  
Cin 0.8  
Quin 7.7  
T.C.A. 5.0  
Q504

- small tree 6 m. tall, 9 cm.  
thick, fls. deep purple. (bark sample)
- small tree 5 m. tall, 8 cm.  
thick, leaves green, in  
age turning reddish.  
(bark sample, regrowth  
after strips have been cut)

seedling 1.5 m. tall, no  
large trees seen.

- scandent shrub,  
leaves gray-green,  
flowers magenta.
- erect shrub 2 m. tall,  
heads yellow.
- vine tangled in bushes,  
fls. yellow.
- erect shrub 1.5 m. tall  
fls. yellow.

vine, fls. white with  
yellowish throat



- ✓ April 13 - headwaters of  
Quebrada Zapa, 7 km. s.w.  
of Pamplona, Norte de Santander  
sub-paramo slope 3200 m.  
L 21758 *Calceolaria minobefaria* Kränzlin subsp.  
growing up through brush  
L 659 *Vallea stipularis*

- with N.C. Fassett ✓ April 13 - grade above  
La Creoba, 20 km. e. of  
Bucaramanga, Santander  
cut bank above road, in  
sparse forest 2400 m.  
L 1 60 *Galium hypocarpium*  
L 2 61 *Merterea granadensis*

L 1 62 *Orchid*  
terrestrial

L 2 63 *Orchid*  
terrestrial

L 3 64 *Panicum*

✓ Apr. 13 - just above La Creoba,  
18 km. e. of Bucaramanga,  
Santander 2230 m.  
bushy steep slope below  
road, second growth.

L 1 65 *Cinchona pubescens* Vahl  
rare, on tree

*minobefaria* slender shrub 1.5 m. tall,  
der. Molau 1982 flo. bright yellow.  
small tree, reddish green,  
fls. bright pink.

- vine-like, fruits orange, fleshy.  
prostrate on vertical bank,  
berries scarlet.  
- ~~ter~~ erect, leaves fleshy,  
flowers dull pink.  
flowers pinkish white  
spreading along

tree 2 m. tall, 10 cm. thick,  
fls. pink, fragrant



✓ April 15 - La Gorney, on  
Quebrada de Gorney, 40 km.  
e. of Puerto Wilches, Santander  
flats of gray to Lalt. 150 m.  
white sand, with little  
or no humus, partly  
open with bunch grass  
and scattered shrubs  
(Byrsonima?), maintained  
open apparently by burning,  
in some places the bush  
is thicker, becoming sparse  
forest, other hammock-like  
patches of ~~more~~ denser  
woods with large trees,  
and small streams  
lined with bush or trees  
or open marshy banks.

L 2 1766

Jussieae

moist sand near stream

L 4 67

grass

wet sand along stream, common

L 4 68

Orch.

dry, sparsely bushy sand flat

L 4 69

Annon.

common in woods and bush  
(Fassett has color photos)

L 2 70

Xyris

moist sand

L 3 71

Blechnum

abundant in ~~moist~~ wet  
sandy places

Remijia purdicana  
is here very common,  
especially in the  
bushy areas, forming  
clumps of sprouts  
2-3 m. tall, flowering  
and fruiting abundantly,  
prevented, apparently,  
from growing to tree  
size by the fires. In the  
hammocks were a  
few sterile sprouts  
which reached 4-5 m.  
tall. The local people  
said there were large  
trees but some distance  
away. Collected seeds from  
one individual (common).  
erect shrub 2 m. tall  
flower ~~or~~ butter-yellow.  
roots to be extensively  
creeping.  
perianth vermillion,  
lip orange, leaves fleshy.  
tree 6 m. tall, leaves  
more or less apparently  
distinctive, flowers  
white, fruit immature  
flowers yellow.

fronds erect.



L 2 72 *Palicourea*  
common along stream

L 2 73 *Rynchospora*  
common in wet sand

L 3 74  
common in wet sand

L 3 75 *Boreria*  
dry sand

L 6 76 *Bernieria purdieana*  
brushy edge of sparse woods,  
common

L 5 77 *Eugenia*  
brushy flat

L 6 78 *Rub.*  
thick woods

L 3 79 *Salic.*  
~~edge of~~ sparsely bushy flat,  
common

L 3 80  
edge of woods

L 3 81 *Eugenia*  
brushy flat

L 3 82 *Cephaelis*  
common in undergrowth  
in thick woods.

shrub 1 m. tall, fl.  
yellow with red lobes,  
buds and unopened  
fruiting into dark red,  
fruits blue-black.

large clumps.

fls. white.

small tree 4 m. tall,  
4 cm. thick, fls. white,  
fragrant. (bark sample)

shrub 2.5 m. tall,  
fls. white, with a  
Philadelphia-like odor.  
slender shrub 4 m.  
tall, in bud only, young  
leaves bronze beneath,  
terminalia-like branching  
characteristic on lateral  
branches.

small tree 4 m. tall,  
~~flowers~~

shrub, fruit red,  
seed with white fleshy aid.  
shrub 1.5 m. tall  
most fruits immature,  
ripe ones red.

shrub 2 m. tall,  
bracts red, flowers  
yellowish.



- L. 1783 *Cephaelis*  
<sup>2</sup> common in ~~sparse forest~~ <sup>in thick forest</sup>.
- L. 4 84 *Melast. ...*?  
 bushy forest.
- L. 4 85 *Xylocarpus*  
 common in sparse forest  
 and bushy flat.
- L. 7 86 *Legum.*  
 sparse forest
- L. 5 87 *Palicourea*  
 common in sparse forest  
 (Farsetti has color photos)
- L. 4 88 *Brysonima crassifolia*  
 very common, dominant  
 shrub in open flats
- L. 8 89 *Rernijia purdieana*  
 common in flats

- shrub 1.5 m. tall,  
~~fls.~~ bracts greenish, fls. white.
- weak shrub 1 m. tall  
 spreading, fls. greenish  
 but with crimson, strongly  
 exserted stamens.
- tree 6 m. tall, branches  
 long and drooping, fruits  
 dark brownish purple.
- tree 4 m. tall, most of  
 leafy branches near  
 top, clumps of prode  
 all along trunk, prode  
 opening when still  
 green, seeds with thick  
 fleshy aril covering dorsal side.
- shrub 1 m. tall (at base  
 2 m.). thyrse <sup>of buds</sup> vermillion,  
 fls. yellow with dark  
 red tips.
- shrub 2 m. tall  
 petals bright yellow
- shrub 2 m. tall,  
 flowers white, lobes of  
 petals recurved, very  
 fragrant.



✓ April 16 - Canyon of Rio Chicamocha  
across from Pescadero, mouth  
of Rio Umpala, Santander  
barren dry crumbly  
cliffs and talus slopes

L 21790

*Palicourea*

steep slopes, scattered brush

L 4 91

*Tournefortia*

dominant shrub on slopes  
at top of cliffs.

L 2 92

*Selaginella*

under bushes on slopes at  
top of cliffs

✓ April 17 - El Retiro, on Quebrada  
Colnada, <sup>10 km.</sup> ~~not far from Beroco,~~  
~~mi.~~ of Velez, Santander  
thick second growth 2475 m.  
woods on dissected plateau.

L 7 93

*Palicourea*

L 2 94 *Palicourea*

L 4 95 *Palicourea*

L 3 96 *Meriania granadensis*  
forming a mat on fallen  
log.

L 3 97 *Palicourea*

700 m.

low spreading irregular  
bushes, gray-green, flowers  
greenish white.  
shrubs 7 m. tall,

forming loose mats.

tree 8 m. tall, fruits green.

seeds in a single layer  
embedded in the pericarp

of a fleshy placenta.

shrub 2.5 m. tall,

immature fruit bluish green.

shrub 3 m. tall, bracts  
purplish, fruits black.

leaves very rugose.

prostrate, berries  
scarlet.

shrub 3 m. tall, fls.  
white, immature fruit  
bluish green, infl. greenish.



L 2179-8 *Palicourea hypocyaniflora*  
 2 in edge of brush

L 99 *Palicourea*  
 edge of brush

## Cuchillo de los Micos

with M.C. Fassett ✓ April 17 - near Helida, 15 km. <sup>n.w.</sup> of Velez, bet. ~~Guahada Barrios~~ <sup>Rio Negro</sup> and ~~Guahada Las Cruces~~ <sup>Rio Quirata</sup>, Santander  
 2100 m.

L 21800 *Ladenbergia macrocarpa*  
 9 isolated small tree in clearing

with M.C. Fassett ✓ April 17 - just south of <sup>Jordan</sup> ~~La Balsa~~, 20 km. n.n.w. Velez, Santander  
 1700 m.

L 1 01 *Spiranthes*  
 grassy bank

L 4 02 *Gurania*  
 wooded ravine

## Villa Alicia,

with M.C. Fassett ✓ Apr. 17 - top of Peña de Velez, 8 km. <sup>n.</sup> of Velez, Santander  
 more or less open plateau  
 L 10 03 *Cinchona pubescens*  
 isolated tree in pasture  
 (Fassett has color photo)

vine-like, climbing  
 - in fruit, orange to red  
 shrubs 2 m. tall  
 fruit immature, somewhat  
 compressed, invol. purplish  
 green.

tree 5 m. tall.

fls. white.

- vine climbing over trees,  
 fls. orange with yellow  
 stamens.

5 m. tall  
 grown & sprout from  
 stump of large tree,  
 leaves dark green above,  
 dull-glossy, flowers  
 fragrant, unusually  
 large, deep crimson  
 without, pink within  
 borders of lobes white, hairs white.



112

1944 - Colombia

with  
N.C. Fassett

L 1804

April 18 - 1 km. n.w. of Velez,  
Lantander 2300 m.  
*Cinchona pubescens* var. *resulenta*  
steep, bushy slope.

with  
N.C. FassettL 05 *Cinchona henleana*

Anal Bell's  
g+c m.m.ta  
cin m.m.ta  
quin m.m.ta  
TCA m.m.ta

L 06 *Cinchona henleana*

Bell's report  
Grabe test neg  
no extraction

L 07 *Eugenia*L 08 *Psychotria*

lant

113

scattered patch of *C. pubescens*  
on bushy slope. <sup>variable in pubescence</sup> see Fassett 25088, 25089

clump of grown stump sprouts  
about 8 m. tall, <sup>largest</sup> 15 cm. thick,  
leaves dull dark green  
above, paler beneath,  
fls. <sup>fragrant</sup> crimson-pink without,  
pink within, lobes  
with broad white ~~border~~  
margins, white hair.  
(bark sample)

"quinon"

slender tree 5 m. tall,  
with fragrant white  
flowers. corolla lobes  
spongy. (bark sample)

slender tree 7 m. tall, 8 cm. thick  
branched at base,  
fls. fragrant, white,  
lobes spongy, in cross section  
A A (bark sample)

"quinon"

vine climbing in trees,  
fruit red, turning black,  
elongate (ellipsoid)  
shrub 1 m. tall, fls.  
pale green.



~~April 12~~  
L. 1309

L. 5 10 *Psychotria*

L. 4 11 *...*

steep slope just below forest  
L. 11 12 *Cinchona henleana*

L. 5 13 *Rub.*

L. 3 14 *Psychotria*

L. 7 15 *Palicourea*

L. 1 16 *Rub.*

L. 8 17

L. 11 18 *Remijia pedunculata*  
a small "mancha" on patch.

shrub 2 m. tall, bracts  
- dull orange-red.  
shrub 1.5 m. tall, flowers  
- white.  
- stems reddish.

"guinon"  
slender tree 6 m. tall,  
5 cm. thick, fls. white,  
fragrant, corolla lobes  
- spongy. (bark sample)  
tree 6 m. tall, infl.  
purple, calyx rose-purple,  
corolla deep lavender,  
with white lobes each  
with a <sup>short</sup> fleshy appendage  
that is lavender. fruits  
- green with dark purple lvs.  
- shrub, 1 m. tall, fls. white.  
- shrub 2.5 m. tall,  
infl. vermillion, flowers  
- yellow, fruit immature.  
fls. white, calyx lobes  
erect in flower, spreading  
in immature fruit. Plant  
with licorice-like odor.

"granizo" used boiled  
- in water for kidney trouble.  
- slender tree 5 m. tall.  
Tree 6 m. tall, 3 cm. thick,  
stipules stiff, leaves  
dull green. "bark sample"  
"quina punta de lanza".

Anal. Bellis

g+c	1.2
cin	0.4
quin	0.4
T.C.A	1.6



L. 1819  
9*Remijia pedunculata*  
small "mancha" n patch

Anal Bellis	
q+c	2.8
lin	0.5
quin	traces
TcA	3.3
(asou)	3.2

Ga 2.4  
Cd 0.4

L. 17 20

*Remijia pedunculata*  
small "mancha" n patchAnal Bellis  
Branches

q+c	1.7
lin	0.5
quin	traces
TcA	2.2
(asou)	nothing

Branches

q+c	2.1	Ca-1.8
lin	0.8	Cd-0.3
quin	traces	
TcA	2.9	
(asou)	2.4	

bet. quebrada Campoalegre (G. Hillis)  
April 20 - San Juan, quebrada  
San Juanito, Rio Guayabitowith  
m.p. forest17 km. w. n. w. of Landazuri, Santander  
steep slope of gray loamy  
soil above a flat of coarse  
sand, slope densely wooded,  
flat sparsely so. 230-330 m.those of *R. purdieana* being  
much longer. The bark  
are distinct, that of *R. purdieana*  
being flexible and light  
yellow within, that of  
*R. pedunculata* being  
brittle and hard, white  
within.tree 10 m. tall, 15 cm. thick,  
buds white, leaves  
dull green, stipules stiff.  
"quina punta de lanza"

(bark sample)

tree 10 m. tall, 12 cm. thick,  
stipules stiff, leaves  
dull green."quina punta de lanza"  
(bark samples from trunk  
+ branches 7 cm. thick).*Remijia pedunculata* and  
a glabrous, large-leaved  
form of *R. purdieana* (or  
something similar) both  
found on this slope, their  
ranges overlapping, but  
the *R. purdieana* extending  
lower ~~and~~ than the *R.*  
*pedunculata* and the  
latter extending on  
up the slope, beyond  
the *R. purdieana*. The  
two remained quite  
distinct, but the *R. purdieana*,  
as compared with that  
seen at La Gomer, had  
a number of *R. pedunculata*  
characters, especially  
in being glabrous and  
in the almost flat  
stipules. The fruits  
of the two are distinct,



- L<sub>2</sub> 21 *Cephaelis* ~~barbata~~  
edges of clearings on sandy flat
- L<sub>2</sub> 22 *Cephaelis*  
woods on sandy flat
- L<sub>6</sub> 23  
open sandy flat
- L<sub>7</sub> 24  
common along road and trails  
in sandy flat
- L<sub>2</sub> 25  
lower slopes
- L<sub>3</sub> 26 *Cephaelis*  
sandy flat, thicket in open
- L<sub>4</sub> 27 *Lipsonia*  
sandy flat
- L<sub>4</sub> 28 *Cephaelis*  
common on sandy flat
- L<sub>4</sub> 29 *Palicourea*  
lower slopes and sandy flat
- L<sub>7</sub> 30 *Remijia* ~~fruticosa~~  
lower slopes
- L<sub>7</sub> 31 *Schizocalyx*  
wooded slopes, common

- shrub 1 m. tall  
- fruits fleshy, blue.  
bracts scarlet.
- more or less prostrate,  
fls. white.  
- shrub 2.5 m. tall (infl.  
and ovaries vermillion,  
corollas ~~are~~ yellow,  
turning reddish with age.  
dwarf shrub
- spawling shrub  
bracts violet, flowers violet.  
- shrub 3 m. tall, strongly  
lemon-scented, disk  
pinkish.
- shrub 1 - 2.5 m. tall,  
bracts scarlet, flowers  
pale yellow.
- shrub 2 m. tall,  
- infl. and fls. yellow.
- small tree 5 m. tall,  
3 cm. thick, leaves dull  
green, stipules flexible  
but not soft, fls.  
white, fragrant, lobes  
recurved.
- ~~tree~~ small tree 5 m. tall  
3 cm. thick (other seen  
much larger), fls. white,  
enlarged calyx lobe  
greenish white, smaller  
one brown-margined.



- L. 21832 *Remijia* <sup>bracteata</sup> ~~purdieana~~  
wooded slope, occasional.

L. 1 33

wooded slope

L. 5 34

*Schizocalyx*

edge of clearing on wooded slope

L. 6 35

*Schizocalyx*

edge of clearing on wooded slope

L. 7 36

*Schizocalyx*

wooded slope

L. 11 37

*Remijia pedunculata*sparsely wooded slope,  
common

Final Bellis	
g+c	1.5
cin	0.4
quin	Traces
TCA	1.9

L. 10 38

*Remijia* <sup>bracteata</sup> ~~purdieana~~  
wooded slope

Final Bellis	
g+c	N.M.T.
cin	
quin	
TCA	N.M.T.

L. 5 39

*Remijia pedunculata*edge of clearing on wooded slope  
abundant

L. 10 40

*Remijia pedunculata*edge of clearing on wooded  
slope, abundant

"quina punta de lanza" or "quina roja"

300 m.

"quina amarilla"

tree 8 m. tall 6 cm. thick,  
leaves dull green, stipules  
flexible but not soft,  
(bark sample; bark flexible)

calyx brown, enlarged  
lobe greenish white.

calyx brown, enlarged  
lobe greenish white.  
corolla white, calyx  
brown when open, enlarged  
lobe greenish white.

300 m.

"quina  
punta de  
lanza" or  
"quina roja"

tree 15 m. tall, 15 cm.  
thick, leaves dull  
green, stiffish, paler  
beneath, stipules stiff  
(bark sample) bark  
brittle, reddish, white within.

300 m.

tree 8 m. tall, 6 cm. thick,  
~~leaves~~ leaves dull green,  
stipules flexible but  
not soft, bracts  
& calyx reddish  
(bark sample) bark  
flexible, yellow within.

330 m.

tree 15 m. tall, 12 cm. thick,  
leaves dull green, stipules  
stiff, fruit immature.

"quina punta de lanza" or "quina roja":

330 m.

Final Bellis	
g+c	1.6
cin	0.3
quin	Traces
TCA	1.9

tree 12 m. tall 10 cm. thick,  
leaves dull green, stipules  
thick, fruit immature. (bark  
sample) bark reddish, white  
within, brittle & hard.



- L 1841 *Remijia* ~~*bracteata*~~  
wooded slope, common

- L 42 *Remijia pedunculata*  
wooded slope, common

Anal. Bellis	
g+c	1.3
cin	N.M.T.
quin	N.M.T.
TC 17	1.3

↓ Apr. 20 - Rio Guayaquito, 14  
km. below Landayuri  
Santander 300 m.  
disturbed ground along  
road

- L 43 *Neurocladus lobata*

- L 44 *Hamelia patens*

Anal. Bellis	
g+c	N.M.T.
cin	-
quin	-
TC 17	N.M.T.

tree 7 m. tall, 5 cm. thick,  
leaves dull green,  
stipules pinnate but  
not soft, calyx and  
bracts reddish, bark  
flexible, yellow within  
(bark sample) "quina  
amarilla".

tree 6 m. tall, 10 cm. thick,  
leaves dull green,  
stipules stiffish,  
fruit immature. bark  
reddish, white within,  
hard & brittle (bark sample)  
"quina punta de lanza" or  
"quina roja".

herb 1 m. tall. "contra garrilana"  
said to be quite effective  
against ~~and~~ fevers.  
upper part rather  
bitter, lower part scarcely  
so. said to become much  
more bitter later.  
bush 2 m. tall, stems  
and cymes red, corollae  
vermillion, becoming  
darker with age, fruits  
red, becoming darker.



✓ April 21 - 5 km. n. w. of Barbosa  
Santander 2000 m.

L. 1845 bushy ravine  
Cinchona pubescens Vahl  
common in brush on ~~the~~ south slope

✓ April 22 - 4 km. n. of Moniquirá,  
Boyacá 1700 m.

L. 46 Cinchona pubescens Vahl  
cleared country, edge of  
steep bank of river

✓ Apr. 22 - 2 km. s. e. of Moniquirá,  
Boyacá 1850 m.

steep brushy slope in  
cleared country

L. 5 47 Cinchona pubescens Vahl

L. 7 48 Borreria  
base of slope

L. 2 49 Viburnum  
base of slope

✓ April 22 - 8 km. s. e. of  
Moniquirá, Boyacá 2150 m.  
brushy second growth on  
sides of ravines

L. 2 50 Hedyscymum

L. 51 Cinchona pubescens Vahl

tree 12 m. tall, 15 cm. thick,  
(bark sample).

clump of stump sprouts  
4 m. tall.

clump of stump sprouts  
4 m. tall, 4 cm. thick,  
fls. white, hairy within.

bush 2 m. tall, fruit  
immature.

small tree, fragrant  
when broken, fruit  
translucent white.

clump of stump sprouts  
4 m. tall, up to 7 cm. diam.  
fls. fragrant, pink lobes  
with white margins + hairs  
(bark sample)



April 27

- L. 21852 *Cinchona officinalis* L.  
small mancha on  
steep slope

stump	sprout	
q+c	3.5	Qa 1.3
cin	2.0	cd 2.2
quin	2.0	
T.C.A.	5.5	
Q504	1.8	

Anal	Thell	Thunk
Qa	3.5	Qa = 0.8
cin	1.8	cd = 2.7
quin	1.8	
T.C.A.	5.3	
Q504	1.1	

- L. 4 53 *Cinchona officinalis* L.  
small mancha on  
steep slope

- L. 3 54 *Coccoloba psidium*  
steep bank above road

- L. 3 55 *Hobleria eximtha* (Benth.) Horn & Hoffm. det. W. H. S. 1972  
steep bank above road

- L. 3 56 *Gurania*  
steep bank above road

✓ April 30 - Quebrada Malagana,  
below San Miguel, road  
from Bogotá to Fusagasugá,  
28 km. s.w. Bogotá, Cund.

- L. 3 57 *Pinus*  
thick forest on steep slope

- L. 5 58 *Palicourea*  
thick forest on steep slope

- L. 3 59 *Quercus*  
road embankment

- L. 3 60 *Symbolanthus*  
steep bushy slope

clump of grove stump  
sprout, largest 18 m.  
tall, 12 cm thick, fls.  
maroon with white  
hair, fruit immature.

(bark samples from  
large trunk 12 cm. and  
small ones 4-6 cm.)

stump sprout 3 m. tall  
fruit immature

fls. lavender, fruit  
blue bluish

herb 0.8 m. tall, fls. scarlet

vine hanging from  
bushes, fls. orange.

2600 m.

tree 6 m. tall, 6 cm. thick,  
buds unopened.

2600 m.

shrub 3 m. tall, infl. and  
fls. bright purple.  
fruit immature  
large clumps

shrub 2 m. tall, fls.  
fls. rich crimson with  
3 white lines within on each lobe.



- L 21861 *Carex*  
roadside
- L 1 62 *Fuchsia*  
cliff above road
- L 4 63 *Fuchsia*  
brushy steep wall of ravine
- L 6 64 *Juncus*  
marshy place above road

✓ April 30 - ~~Rio~~ Headwaters  
of Rio Muña, just below  
San Miguel, 26 km. s.w. Bogotá  
Cundinamarca 2800 m.  
cleared slopes with small  
patches of second growth.

- L 7 65 *Borreria bogotensis*  
road cut
- L 8 66 *Gaiodendron tagua*  
evidently not parasitic.
- L 3 67 *Galium hypocarpium*  
grassy, bushy bank

✓ April 30 - El Salto (Falls)  
de Tequendama, Rio Bogotá  
of Bogotá, Cundinamarca

- L 7 68 *Passiflora*  
slope above river

- 2800 m. small clumps, culms  
spreading-ascending.  
fls. pendent, deep crimson
- shrub 1.5 m. tall, fls.  
scarlet, ovary square  
in transverse section.
- 2850 m. in clumps. (mass collection  
of upper part of ~~flower~~  
fertile culms taken,  
each piece from a different  
clump.)

- prostrate, flowers purplish  
without.
- tree 5 m. tall, fls. white,  
fruit reddish when  
mature or almost so.
- fls. yellow, fruit,  
fleshy, bright orange.

- 2450 m. spreading tree, fruit immature  
(same tree as # 21032)



✓ May 1. near La Sierra, (km. 80  
on road from Bogotá to Puerto Cambao),  
21 km. w. of Facatativa, Cund.  
steep slope, cleared and  
planted to Manihot,  
coffee plantation just below.  
Cinchona pubescens Vahl

L. 21369  
10

L. 9 70 Cinchona pubescens Vahl

drainage of Quebrada Chiniata,  
✓ May 1 - 5 km. ~~so~~ e. of Hills, 12  
km. w. of Facatativa, Cund.  
along cascades in bottom  
of wet steep <sup>wooded</sup> ravine

2150 m.

L. 71 Psychotria

L. 72 Psychotria

L. 73 Psychotria

scattered C. pubescens  
trees, some used as  
shade for coffee.

1950 m.

Final Bellis

q+c	m.m. tr
ci	1.4
qui	m.m. tr
T.C.A.	1.4

small tree 6 m. tall, 8 cm.  
thick, leaves green, dull  
dark above, paler beneath,  
fruit immature  
(bark sample 13)

Final Bellis

q+c	m.m. tr
ci	1.4
qui	m.m. tr
T.C.A.	1.4

stump 25 cm. thick, partly  
decayed, with clump  
of young stump sprouts  
6 m. tall, 3-7 cm. diam.  
lvs. <sup>dull</sup> green, paler beneath,  
fls. fragrant, pink with  
paler margins to lobes,  
white hairs.  
Stems badly cankered,  
fruits diseased. (bark  
sample 14)

fls. pale green, fruit immature.  
~~fls.~~ fls. pale lavender  
shrub, growing more or  
less horizontally, 1.5 m. long,  
nodes enlarged, fls. and  
fruit white.



May 1 - Drainage of Quebrada  
Chiniata, 8 km. E. of Hilo,  
9 km. W. of Facatativa, Cund.  
sparsely bushy slope

21874

*Oenothera*

grassy slope

L 7 75

*Cinchona pubescens* Vahl

L 4 76

*Euphorbia*

grassy slope, abundant

May 1 -

just W. of Macall, Salina  
de Bogotá, 25 km. W. of  
Bogotá, Cund. 2650 m.

L 5 77

*Eleocharis*

in water in roadside ditch

L 11 78

*Limnobiium*floating in water in roadside  
ditch

↓

May 6 - Paipa, Boyaca

2577 m.

with  
H. St. Johnsubparamo bushy steep slope  
just above salt flats

L 7 79

*Senecio*

L 7 80

*Hedyotis nitida*  
rocky places

fls. yellow

stump with several  
growing stump sprouts  
6 m. tall, leaf veins  
red, fls. fragrant,  
crimson red without,  
pink within with  
white hair.

flat to red

leaves with a thick <sup>pale green</sup> pad of  
large air-cells beneath,  
dark green above, fls.  
greenish white just  
exserted above water.

diffuse round-topped bush  
3 m. tall, fls. yellow.  
more or less decumbent brittle  
shrub, buds pink, <sup>purple</sup> fls. white within.



- L. 21881 *Vernonia*  
climbing in bushes
- L. 82 *Vernonia*
- L. 83 *Phytolacca*
- L. 84 *Palicourea*
- L. 85 *Vernonia*
- L. 86 *Dodonaea viscosa*  
abundant  
(specimen for  
St. John)
- L. 87 *Gnaphalium*
- L. 88 *Vicia*  
growing up thru bushes
- L. 89 *Leavenworthia portulacastrum* L.  
same loc. salt flats  
edges of streams from  
hot springs. (specimen for  
St. John)
- L. 90 *Polygonum*  
bank of depression  
(specimen for Brenckle)
- L. 91 *Oxalis*  
higher places in flat, rare

- lactiferous vine, fls. white
- bush 2 m. tall, loosely  
branched, fls. purple.
- much branched  
herb 0.5 m. tall, 1 m.  
wide, stems fleshy,  
fls. pinkish white,  
fruit immature.
- shrub 1 m. tall, branches  
ascending, fls. white,  
irregularly branching
- shrub 2 m. tall, fls.  
purplish.
- shrubs 1-2 m. tall (specimens  
from several different  
plants growing together),  
fruits reddish.
- shrub 1.5 m. tall, fls. white,  
fragrant.
- fls. violet
- ~~large~~ large mats, leaves  
fleshy, fls. pink.  
stems with only traces of red color.
- erect
- fls. pink, cernuous



L 21892

*Cardiomena ramosissima*  
banks and raised sandy  
places, roadsides

L 393

*Borreria*  
raised places, common

✓ May 7 - Upper Rio Sarba, 15 km.  
n. w. of Duitama, Boyacá 3300 m.  
luxuriant subparamo brush

L 494

*Hedyotis nitida*

L 595

*Hypericum*

L 696

*Hedyotis nitida*

L 197

*Viola*

rare in grassy banks along trail

L 198

*Castilleja*

only one of this color seen

L 499

*Weinmannia*

common

L 1900

*Castilleja*

prostrate from strong  
tap root, buds tipped  
with dark red, ~~fls~~ corolla  
white, pilose within,  
drooping ~~at~~ at slightest  
provocation.

2 species of *Espeletia* common  
(*E. cymbosa* type not in flower).

shrub branched at root  
crown, 0.6 m. tall, leaves  
whitish beneath, buds  
purplish, ~~fls~~ white inside.

shrub 2 m. tall, fls.

bright chrome yellow.

shrub 1 m. tall (others  
seen up to 2 m.), buds  
purplish, fls. white  
within, leaves white  
beneath.

fls. white with ~~at~~ deep  
purple markings, especially  
on lower petal.

bracts, calyx and corolla red.

shrub 2.5 m. tall.

upper bracts red distally,  
calyx red, margined with  
yellow, corolla red but upper edge  
green distally.



- L 21901 *Geranium*  
mostly in grass clumps
- L 02 *Galium hypocarpium*  
climbing on *Espelletia*
- L 10 03 *Espelletia*  
very common

35 km. s. Charalá

✓ May 7 - Páramo de Birolin, on  
Santander - Boyaca boundary,  
~~20 km. s. of Encinas, Santander, 25~~  
km. n. w. of Duitama, Boyacá

- L 04 *Hedyotis mutica* <sup>3700 m.</sup> recently burned  
common on ledges and rocky  
places
- 1 05 *Lobelia tenera*  
occasional in shallow soil
- L 3 06 *Hedyotis nitida*  
common

- L 07 *Apium*  
occasional
- 30 km. s. of Charalá

✓ May 7 - near head of Rio Negro,  
affluent of Rio Pienta, 16 km.

- L 13 08 *Cinchona pubescens* Vahl  
common in partially cleared  
woods, only seen above *Quercus* belt

fls. rose-purple.

fruit orange, fleshy.

~~stem~~ large rosette on  
columnar stem 1 m. tall,  
flowering cymes erect,  
ray fls. bright yellow, <sup>dull</sup> disc brown.  
(fruiting cymes spreading,  
from different plant).

forming dense mats,  
fls. purplish white.

fls. violet

low shrub 2-3 dm. tall,  
leaves white beneath,  
buds purple without,  
fls. white within.  
fls. white.

tree ~~10~~ m. tall, 12 cm thick,  
veins reddish beneath, fls. fragrant,  
dull crimson, pale inside with white  
borders to lobes. (bark sample)

Rural Bellis  
a+c 1.3  
lin 0.4  
quin N.M.T  
f.c.A 1.7



✓ May 8 - just above Comoro,  
13 km. e.n.e. of Charalá,  
Santander 1850 m

L 21909 (~~Ladenbergia~~) *linchua*  
second growth on sterile steep slope

✓ May 8 - ridge 3 km. n.e. of  
Comoro, 15 km. e.n.e. of  
Charalá, Santander  
bushy second growth 2030 m.

L 10 *Pub.*  
tangled in brush

L 8 11 *Ladenbergia*

L 3 12 *Palicourea*  
along trail

✓ May 8 - ridge <sup>5 km.</sup> n.e. of Comoro,  
17 km. e.n.e. of Charalá,  
Santander 2300 m.  
wet forest on slopes

seedlings & sprouts, saplings  
common in forest.

trees here seem infected  
by the disease that elsewhere  
attacks *C. pub.* *C. pub.* is not  
found here, but is at much  
higher altitudes in the region.

L 4 13 *Cinchona officinalis*  
open clearing, rather recent.

L 3 14 *Palicourea*  
occasional

tree 6 m. tall, 8 cm. thick,  
fls. white, fragrant.

~~tangled in brush~~, woody vine,  
fls. white.  
- tree 5 m. tall, 7 cm. thick,  
- fls. white, fragrant.  
- shrub, m. tall,  
infl. and calyxes rose,  
corolla lavender.

*C. officinalis* has been  
taken out of this area  
in considerable quantities -  
20 tons acc. to the owner.  
Stripped trunks are  
lying here and there,  
other, peeled trees still  
standing, peeled up as  
high as 10 m. by bark thieves.  
The trees are common but  
not evenly scattered  
stump sprouts probably  
less than ~~year~~ 1 year old,  
from harvested trees.  
- shrub 2.5 m. tall, infl.  
& fls. brilliant deep purple.



- L 21915 *Cinchona officinalis* L.  
steep slope

Anal. Bell's  
q+c 4.4  
cin 0.9  
quin. N.M.T  
T.C.A 5.6  
QSO<sub>4</sub> 1.4

- L 216 *Cinchona officinalis* L.  
steep slope

- L 17 *Cinchona officinalis* L.  
small flat place

Anal. Bell's  
q+c 4.2  
cin 0.5  
quin N.M.T  
T.C.A 4.7  
QSO<sub>4</sub> 1.1

- L 4 18 *Cinchona officinalis* L.  
steep slope

Anal. Bell's  
q+c 3.3  
cin 0.4  
quin N.M.T  
T.C.A 3.7  
QSO<sub>4</sub> 1.7

San Juan,

✓ May 11 - ridge bet. quebrada San Juanito and Q. Campoalegre (Q. Quillás), valley of Rio Guayabito 17 km. w. n. w. of Landaguri, 5 km. s. e. of Cimatara, Santander

250 m.

- L 19 *Trichomanes*  
steep wooded slope

- Tree 15 m. tall 20 cm. thick, buds purplish, infl. diseased, old leaves bright crimson. (bark had been peeled up 10 m.) (bark sample).  
fruiting panicles from a tree that has been cut some time ago, just to show fruit and disease.  
- small tree 8 m. tall, 7 cm. thick, sterile. (bark had been removed from base, sample taken from above this, to see if it differs significantly from nearby healthy tree.)  
- ~~say~~ sterile sapling 7 m. long, 5 cm. thick, leaning. (bark sample)

*Remijia pedunculata* trees here have on twigs nests of small ants, housing mealy-bugs.





144

1944 - Colombia

Magdalena Valley,

✓ May 11 - 20 km. e. of Puerto Olaya  
(~~Antioquia~~) Santander 150 m.L 21920 Gonzalagunia  
4 wet roadside, low flat land.✓ May 11 - Magdalena Valley,  
4 km. e. of Puerto Olaya, Santander  
roadside fence-row, 150 m.  
low flat land.

L 3 21 Bisca

L 12 22

with  
H. St. John ✓ May 11 - <sup>River</sup> Magdalena Valley,  
Puerto Olaya, Santander 150 m.  
L 23 Hamelia patens  
edge of marshy placeMay 9 - 5 km. s.w. of San Gil,  
Santander  
on the rocks of a dry waterfall  
were dead bodies of a large  
neuropterid, several hundred  
of them, a few with the  
abdomens distended✓ May 14 - Villavicencio, Meta  
Cultivated (Bates garden)

L 24 Solanum

L 25 Commelina  
(said to be from nearby forest)L 26 Piper  
(grows wild in region)

Santander - Meta

145

shrub 0.7 m. tall, very bushy,  
fls. white.small tree  
tree 8 m. tall, enlarged.  
calyx lobe <sup>bright</sup> purplish pink.shrub 1 m. tall, fls. deep  
orange.with eggs, most with  
the abdomens burst  
and the eggs lying  
in pile and patches or  
scattered over the stones  
to several cm. from the insect,  
stuck to the rocks.vine climbing on house.  
- fls. lavender, fruit scarlet.  
- sparsely branched vine,  
fls. lavender, fruit purple.  
- shrub 2 m. tall, spikes  
erect.



L 21927

L 28

Isertia

(brought in from llanos ~~no~~  
on road to Puerto Lopez)

L 29

~~Isertia~~

(brought from nearby forest)

with  
M.L. GrantMay 16 - Finca Rosa Blanca,  
foothills just south of  
Villavicencio, <sup>Ind. de</sup> Meta 500-700 m.  
wet forest, partly cleared.

L 30

Rubi. ~~farinacea~~

slope, edge of clearing, rare

L 31

Rubi.

slope, edge of clearing

L 32

~~Solan.~~

wooded slope

L 33

Rubi.

wooded slope

L 34

Cephaelis

wooded slope

L 35

~~Marant.~~

wooded slope

L 36

Phytolacca

edges of clearings

clumps, fls. white.  
bush 3 m. tall, infl. <sup>7-9 mm</sup>  
coral-vermillion, buds  
yellow, flowers turning  
orange.  
shrub 2 m. tall, bracts &  
corollas scarlet.

tree 15 m. tall, fls. white,  
fragrant, ~~also~~ flowering abundantly.  
tree 20 m. tall, sterile,  
trunk corded & granular  
(Marstonia ~~intermedia~~ but in  
identity because of ~~the~~  
holes housing ~~myrmica~~  
larvae)  
shrub 1 m. tall, <sup>sparsely branched</sup>, fruit dark  
purple, fleshy.  
shrub 1.5 m. tall, fruits  
greenish white.  
shrub 0.7 m. tall, bushy,  
bracts bright purple,  
fls. purplish-white.  
shrub forming thicket  
2 m. tall, 3 m. across.  
fls. white, fruit deep orange  
herbs 1-2 m. tall, infl.  
rose-red, fls. pinkish, fruit  
immature. (mass collection  
from different plants) (for ~~analysis~~)







L 1950 *Euphorbia* *polyphylla* M. & A. det. Harknide, 1977.

Wooded flat at foot of slope

L 51 *Palicourea prunicea*  
common in wooded flat at foot  
of slope.

L 52 *Ardisia*  
wooded flat at foot of slope

with  
m. f. quant ✓ May 17 - 5 km. s.e. Servita,  
just above Buena Vista, 4 km. s.w.  
of Villavieja, Meta 1000-1100 m.  
wet wooded slopes and ridges

L 53 *Blechnum preposoides* Radde det. Lellinger 1975  
wet road cut

L 54  
wet road cut

L 55  
wet road cut

L 56 *Coccoloba*  
wooded ridge

L 57 *Isertia*  
common on wooded ridge  
(and throughout region)

L 58  
steep wooded slope

L 59 *Remijia pedunculata* (Pav.)  
steep wooded slope, common.

shrub (m. tall),  
bracts scarlet, fls.  
yellow, fruit bright blue.  
shrub up to 1 m. tall,

leaves with <sup>main</sup> 3 parts.  
"yoda de la culatra"

fls. white with yellow  
center.  
vine, fls. white.

prostrate, fls. purple,  
fruit bright blue.  
tree 6 m. tall, spreading,  
fls. white, fragrant.

shrub 1.5 m. tall, fls.  
white, fruit immature,  
many-seeded.  
tree 8 m. tall, bark bitter,  
leaves dull.



~~with~~ ✓ May 24 - s. side of Valley of Rio  
Guavio, 5 km. s.e. of Ubalá  
Cundinamarca 1700 m.

L 21960

planted along road in large  
finca.

with ✓ May 24 - Gachalá, Cundinamarca  
m. l. Quint 1760 m.

L 7

61 Abutilon

planted in gardens.

with  
m. l. Quint

✓ May 24 - Finca Santa Elena,  
just e. of Gachalá, Cund.  
1750 m.

L 3

62 Rhododendron

in garden

L 2

63 Galium hypocarpium

climbing in bushes

L 5

64 Thea sinensis

in small tea plantation  
on cleared slopes.

tree 15 m. tall, branchlets  
with weeping habit.

shrub 3 m. tall, fls. pendent,  
petals with ~~the~~ yellow  
ground color, deep red veins,  
stamens dark red, column  
flesh color. "hostensis".

bush 1.5 m. tall, fls. white.

vine-like, fruits orange, fleshy.  
"coralito".

tree 6 m. tall, fls. white.

(These trees let grow large  
to produce seed. The seeds  
fall to the ground and  
germinate, producing  
thousands of seedlings,  
which are then transplanted.  
A seedling, a seed, and a  
cutting are planted together,  
in hopes that one will survive.  
The trees from which leaves are taken  
are kept pruned down to about 1 m. tall.)



May 26 - San Ysidro, s. of  
Gachala, Cund. - 2450 m.

Dense rain-forest, on various  
slopes and flat places.  
The area forming the  
headwaters of a large  
quebrada, with many  
small streams. *Cinchona*  
*officinalis* is common on  
steep slopes and ridges,  
but most of what we saw

✓ May 27 - Gachala, Cundinamarca  
region of Rio Guariso  
along trail in cultivated land.

21965 *Lobelia*

4

✓ May 28 - 10 km. s. of Gachala on  
trail to Medina, Cord. de Farallones  
(Cord. de Heliconia), Cundinamarca  
bushy steep slope, scattered  
trees, probably second-growth  
2150 m.

L 666 *Vismia*  
commonest tree in second growth

was small. Seedlings  
and sprouts are quite  
abundant, small trees  
less so, and large trees  
quite rare. Collected  
bark from trunk & branches  
of one (Grant & Forberg #9309).  
The men said they have taken  
679 arrobas of green bark  
from this immediate region.  
A tree lower down is Grant & Forberg 9352.

immediate vicinity of  
village cleared and in  
cultivation or pasture, with  
patches of second growth  
here and there, especially on  
ridges and steep places,  
*Vismia* sp. (~~#21966~~ #21966)  
- most common tree.  
herb with many  
arching stems from base,  
flowers bright red.

small tree, fls. with  
greenish-bronze petals,  
brown calyx. sap orange.



156

1944 - Colombia

21967

small

parasitic on *Ladenbergia*

L 13 68

*Ladenbergia*

L 15 69

*Cinchona officinalis*

Anal. Bellis Walde

near base		from above	
Q+C	4.1	Q+C	3.7
Cin	0.3	Cin	0.3
Quin	Traces	Quin	N.M.T
T.C.A.	4.4	T.C.A.	4.0
(Q+C)	2.9	(Q+C)	2.7

from above

Q+C	3.7	Qa=2.0
Cin	0.3	Ca=1.7
Quin	N.M.T	
T.C.A.	4.0	
(Q+C)	2.7	

L 5 70

*Cybianthus laurifolius* (Vay.) Agostini

Ed. Agostini 1956

in thick brush

L 6 71

*Coccoloba*

along trail, common

L 8 72

*Bomarea*

occasional on ridges

hills  
 June 12 - 1 km. s. of Luba, 13 km.  
 n. of center of Bogota, Lund.  
 grazed subparamo slopes (2700 m.)  
 with scattered <sup>small</sup> *Myrsine* trees.

L 4 73

*Myrsine*

common in open places

L 7 74

*Eryngium paniculatum*

occasional small colonies

L 6 75

*Vaccinium*

in patches of low brush

Cundinamarca 157

ripe fruit orange-red.

small tree

tree 6 m. tall, 8 cm. thick,

fls. purple with white

hair. (bark samples, one

from near base of trunk,

one from above a part where

1/2 of bark had been

removed some time before)

sprawling shrub 1 m. long,

fruit immature.

prostrate herb, fls.

purplish, fruit blue.

rosettes with ~~upper~~

leaves erect, outer divergent -

ascending inflorescence

almost 2 m. tall, ~~and~~~~the~~ branches of the

first order forming

racemes of bright

scarlet flowers.

individuals solitary,

fls. white.

shrub 20.7 m. tall, fls.

coral red, pale green

distally, fruit reddish when ripe.



21976

common in low bush

L 3 77

rare on ridge

L 4 78

common, terrestrial

L 4 79 *Alnus*small colony ~~in~~ in somewhat sheltered placeL 4 80 *Gaultheria*

common on exposed open spots

L 4 81 *Hedyotis nitida*

occasional in low bush

L 5 82 *Calea pennellii*

common

det. S. F. B.

L 5 83 *Myrsine*

common

L 2 84 *Castilleja*

cultivated around ranch-house

L 4 85 *Prunus*L 4 86 *Solanum jasminoides*L 2 87 *Cedrella*

vine, fls. white.

shrub 0.8 m. tall.

~~fls.~~ leaves very thick,  
fls. varying shades  
- of pink, fruit reddish  
shrubs 1.5 m. tall

fls. deep pink, fruit black.

- fleshy

bushes 0.5 m. tall.

buds purplish, flowers  
white within, leaves  
whitish beneath.

bush up to 0.5 m.

- fls. bright yellow.

tree 3 m. tall, fls.  
yellowish white.

- fruit immature.

upper bracts + calyx scarlet distally,  
corolla green with lower edge orange.

tree 6 m. tall, leaves

rather young, flowers  
white, with a rather  
nauseating odor, fruit

- immature.

vine climbing over

- trellis, flowers white.

large tree 1.5 m. tall,

leaves dark green.

fruit very immature, mature  
ones out of reach several cm. long.



✓ June 25 - Choachi, Cundinamarca  
~~cut~~ street tree, common,  
 usually cut back for  
 firewood, giving a pollard-  
 appearance.

L 1938 *Salix humboldtii*

✓ June 30 - Cali, El Valle  
 old road on a weedy, brushy  
 slope 1040 m.

L 4 89 *Psidium guineense*

L 6 90 *Lasiacis*  
 thicket

L 3 91 *Lobelia*

L 4 92 *Waltheria*

L 7 93 *Heliconia*

L 5 94 *Jacquemontia*

L 4 95 *Lilium*

L 5 96 *Tecoma stans* L.

L 3 97 *Stemodia*

L 3 98 *Stemodia*

L 6 99 *Eugenia*

diffuse habit.

- shrub 2 m. tall  
 cane-like but bushy 2 m. tall

- erect herb with sage-like  
 odor, fls. whitish.

- erect shrub 1 m. tall,  
 fls. yellow.

- branched shrub 1 m.  
 tall, fls. white, fruit  
 purple-blue. Leaves

- greasy-lustrous above.

- vine with blue flowers.

- fls. yellowish

- bush 2 m. tall, fls.

bright yellow, pods

- hanging vertically.

- herb 1 m. tall, flowers  
 violet.

- herb 1.5 m. tall, fls.

- pale pink

- shrub 2 m. tall,

fls. white, fruit immature



L2000 lost.

- L3 01 *Stylosanthes*  
in road  
L1 02 *Richardia scabra*

July 1 - N. fork of Rio Yumbo,  
5 km. W. N. W. of Yumbo, 15 km.  
N. of Cali, El Valle 1450 m.  
wooded ravine, second growth.

- L4 03 *Tournefortia*  
eroded open slope  
L2 04 *Galium hypocarpum*  
growing up thru brush  
at edge of woods  
L3 05 *Cosmibuena*

- L4 06 *Chiococca alba*  
underbrush in ravine  
L10 07 *Cosmibuena*

July 1 - near small affluent of Rio Pava,  
half-way bet. La Cumbre & Pitaco,  
17 km. N. N. W. of Cali, El Valle 1650 m.  
hedgerow along road, cleared land

- L1 08 *Ladenbergia*

shrub 2 m. tall, branches  
long, spreading, fl. white.  
fls. yellow

ascending herb, decumbent  
at base, fls. whitish.

bush up to 1 m., fls. dirty  
white.  
fruit orange, fleshy.

tree 10 m. tall 25 cm. thick,  
leaves coriaceous, smooth,  
turning deep red when  
old, fls. white, turning  
orange-brown when old,  
unpleasantly very fragrant,  
fruit immature  
elongate shrub, fruits  
white, fleshy, then dry.  
tree 10 m. tall, 20 cm. thick,  
leaves coriaceous, smooth,  
turning deep red when  
old, fruit immature (bark sample)

tree 10 m. tall, leaves glossy,  
fruits reddish when not quite ripe.



hills n. of

July 9 - Choachi, Cundinamarca

L. 22009 *Tournefortia*  
brushy patch on cleared steep slope 1900 m.July 9 - hills s. of Ubaguá, Cundinamarca  
steep ~~eroded~~ <sup>badly eroded</sup> slope 2150 m.

L. 6 10

common

L. 5 11

*Vaccinium*

common

L. 4 12

*Dodonaea viscosa* L.

common

L. 2 13

*Dicromena*

common in grassy place

L. 1 14

*Borreria*

rare

L. 1 15

*Solanum*

occasional, ridge top

L. 1 16

*Coccythospermum*

rare in brushy patch

L. 4 17

*Symbolanthus*

scattered

L. 2 18

*Passiflora*

in brush patch

L. 5 19

*Eupatorium*

common

shrub 1.5 m. tall, fls. white.

large clumps, leaves  
thick, leathery, fls. translucent  
buff color.

low bushes up to 0.8 m.

fls. <sup>dull</sup> coral pink with  
green distal 1/3, ~~the~~ bracts  
dull coral, fruit immature.

- young leaves red.

- shrubs up to 0.8 m. tall.

- fruit dark maroon purple.  
bracts white

fls. white.

low shrub, corolla purple,  
stamens orange-yellow,  
androecium slightly

- zygomorphic.

prostrate herb, fls.

- violet

shrub 1-2 m. tall,

fls. light green, somewhat

- zygomorphic.

vine, fls. greenish white

infl. & involucre maroon,  
fls. white, herbage  
aromatic



✓ July 16 - El Chico, just at  
northern outskirts of Bogotá  
brushy subparamo slopes  
3000 m.

L 22000 *Justicia*  
common in bush up to a  
much higher altitude

✓ July 16 - Paramo above El Chico,  
~~and~~ just north of Bogotá,  
the highest point of which  
bears <sup>mark</sup> ~~the place~~ where the  
municipios of Bogotá, Usaquen  
and La Calera come together  
paramo on mostly 3150 - 3350 m.  
sandstone ledges.

L 21 *Lycopodium*  
occasional

L 22 *Jamesonia*  
common

L 23 *Nertera granadensis*  
shaded by deep brush in  
ravine

L 24 *Bartschella*  
common

L 25 *Justicia*  
common, scattered

#  
L 26 *Rhynchospora*  
common on open slopes

27 *Lipthocarpus columnar*  
common in sparse bush

- shrub 1.5 m. tall, flowers  
yellowish-white.

erect

erect, rhizome deeply buried

forming mat on ground  
flowers yellow-green, fruits  
- bright red, fleshy.  
erect, calyx purple,  
- corolla yellow.  
shrubs 1.5 m. tall, calyx  
and hypanthium red,  
- corolla deep purple.  
isolated plants, culms  
- erect.

bush 1 m. tall, erect, corolla  
somewhat inflated, orange-  
red with yellow-green  
lobes, sap milky.



- 220, 28 *Lobelia tanaera*  
occasional, especially in sandy  
burned places
- L. 8 29 *Pinguicula*  
local on flat ridge tops  
in black soil with admixture  
of sand.
- L. 30 *Xyris*  
local
- L. 31 *Eriogonum lindigii* (Mett.) Watschke det. Torgon 1970  
~~under~~ west-facing rock  
crevices.
- L. 32 *Graphalium*  
common on rocky slopes
- 33 *Fenecis*  
common on rocky slopes
- L. 34  
common on rocky slopes

July 25, Granadas, on Rio Less,  
ne of headwaters of Rio Lubia,  
7 km. s. w. of Charquitos, Cund.  
pasture, fence row 2500 m

- L. 12 35 *Cinchona pubescens* Vahl. var.

rosettes occasionally mat-forming  
fls. blue-violet

hairs on leaves with  
droplets of fluid, flowers  
violet.

small clumps,  
flowers yellow.

heads straw-color

leaves leathery with  
impressed veins, fls.  
greenish white.

roots orange, leaves  
distichous, fls. yellowish.

Anal. Mellis	
Q+C	1.6
di	0.7
Qui	mm. to
P.C.A.	2.3

tree 8 m. tall, ~~15~~ 15 cm. thick,  
young growth sticky, stipules  
reflexed, veins of leaves  
reddish, leaves appearing  
rugose <sup>above</sup> from impressed  
secondary veins.



July 25 - head of Rio Leco,  
one of headwaters of Rio Subia,  
5 km. s. w. of Charquito,  
Cund.

2750 m.

w. slope, partly cleared and  
grazed.

L 22036

8

pasture

- L 37 *Polygonum nepalense* Meisn. <sup>det. n.c.f.</sup>  
pasture, the most  
abundant plant but  
mostly not flowering.

L. 5

38

*Fuchsia*

opening in edge of forest

L. 4

39

*Cinchona pubescens* Vahl  
edge of forest

L. 4

40

*Fragaria*

pasture, abundant

L. 2

41

*Galium hypocarpium*

on old stump in pasture

L. 3

42

*Lophocampylus Benthamianus* Walf. <sup>Russ.</sup>

climbing in tree in pasture

L. 3

43

*Nertera granadensis*

abundant in pasture in  
sheltered places and on  
hummocks

2 km. n.e. granadan.

rounded tree 5 m. tall,  
fruit immature, ripest  
ones turning reddish.  
fls. pink

shrub 3 m. tall,  
fls. scarlet, pendent,  
ripe fruits oval, black,  
fleshy, unripe green,  
cylindrical.

small crooked tree  
5 m. tall, 6 cm. thick,  
sterile, young growth  
sticky, leaves not  
especially rugose  
above, dull.

flowers white, fruit  
red, pleasantly acid,  
prostrate, fruits orange,  
fleshy.

vine, flowers crimson-purple  
anthers black

prostrate, fruits  
scarlet, fleshy.



172

1944 - Colombia

L. 22044 Solanum  
common along trail in  
forest

L. 45 Solanum  
common along trail in  
forest

L. 46 Solanum  
with Valencia  
C. W. Valencia

✓ July 28 - Bucaramanga, Sant.  
weedy roadside 1025 m.

L. 47  
L. 48 Polygala  
L. 49 Craton  
L. 50 Diodia

L. 51 Chloris  
L. 52 Cissus?  
L. 53 Phlox drummondii  
cultivated in window  
boxes and patios of Hotel Bucarica

July 30 - hills around headwaters  
of quebrada San Francisco,  
back of Bogota, Cund.  
paramo slopes 3400-3500 m.

L. 54 Pinguicula  
flat sandy burned place  
on top of ridge, one plant seen.

L. 55 Aragoa  
abundant on steep rocky slopes

L. 56 Velema  
in bush

(3150 m.)

Cundinamarca 173

- Santande

shrub 2 m. tall, fls.  
white with yellow  
anthers (appears same  
as #22045)

- straggling weak shrub  
3 m. tall, fruits translucent  
shining red. (appears  
same as #22044)  
fls. white.

- stungly aromatic, fls. purple.  
- fls. pale greenish  
- fls. white  
prostrate, stiff,  
fls. white.

flowers magenta with  
darker eye.

hairs with a droplet of  
liquid at apex, flower  
blue-violet.  
- plant gray-green, 1.5 m. tall

scandent shrub, climbing  
on other shrubs, fls. white.



- L. 22057 *Aragoa*  
abundant on rocky slopes
- L. 58 *Apium*  
common locally, especially  
on flat places.
- L. 59 *Castilleja*  
common locally
- L. 60 *Aragoa*  
rare on rocky slopes
- L. 61 *Orthozanthus chimborazensis*  
common, especially in  
disturbed places.
- L. 62 *Solanum*  
occasional in bushy ravine (3300m)
- L. 63  
vertical earthy bank (3700m)
- L. 64 *Berberis*  
bushy ravine (3200m)
- July 30 - <sup>Cerro</sup> Paramo de Guadalupe,  
back of Bogota, Cund.  
subparamo with somewhat  
scattered brush
- L. 65 *Eccecris coarctata*

- shrub 1.5m. tall, gray green,  
- fls. white.  
strong odor, fls. white.
- bracts + calyx scarlet  
distally, corolla green  
- ~~above~~ above, orange yellow below.  
shrub 1 m. tall, green,  
fls. white, <sup>growing</sup> with the  
common species represented  
by # 22055 + 22057 -  
clumps, leaves + scapes  
erect, fls. blue-violet.
- spawling herb leaning on  
other plants, fls. lemon  
yellow, fruit purple-black  
- when ripe (but only one seen ripe)  
erect.
- shrub, leaves white  
beneath, fls. chrome yellow.
- small clumps, leaves  
and scapes erect, flowers  
violet, seeds apparently  
ripe when fruit is still  
green and somewhat fleshy.  
stamens 4.



with  $\checkmark$  Aug. 5 - halfway bet.  
 J. Bellis Jucayabitá and Servita,  
 canyon of Rio Negro, Cund.

steep brushy slope, second  
 growth

L. 22066 Laranja

L. 8 67 Rondelêlia

with  $\checkmark$  Aug. 5 - 2.5 km. s.e. of Servita,  
 J. Bellis just w. of Buena Vista,  
 6 km. n.w. of Villavieja, Meta  
~~steep ridge~~ edge of clearing 1000 m.  
 of steep side of ravine

6 68 *Remijia pedunculata*  
 semi-shade

Anal. Bellis	
Q+C	0.6
Cin	0.6
Quin	traces
TCA	1.2

11 69 *Remijia pedunculata*  
 semi-shade

Anal. Bellis	
Q+C	N.M.F.
Cin	1.00
Quin	traces
TCA	1.0

70 *Remijia pedunculata*

Anal. Bellis	
Q+C	N.M.F.
Cin	0.5
Quin	N.M.F.
T.C.A.	0.5

small tree 4 m. tall.

buds white

shrub 2.5 m. tall.

fls. with dull red tube,  
 bright rose throat, white  
 lobes.

branch of *Remijia*

partly cleared

all trees collected have a sticky  
 substance between stipules)

collection  
 of stipules  
 taken at random  
 from same tree

small tree 7 cm. thick, about  
 5 m. tall, flowers white,

lobes recurved. (Bark sample)

small tree 9 cm. thick, about  
 6 m. tall, flowers white,

(bark sample) (collection  
 of stipules taken at random from same tree)

base of clump fused  
 with several other

species into a common trunk,  
 this sprout about 7 cm. thick,

5 m. tall, fls. white. (bark  
 sample) (collection of stipules

taken at random, from same  
 tree)



22071

*Remigia pedunculata*

Anal. Bellis

smaller branch

q+c 1.7

cin 0.6

quin 0.1

T.C.A. 2.4

q+c - 1.5

cin 0.9

quin. est. 0.1

T.C.A. 2.5

Larger branch

Aug. 6 - Low hills just  
~~toward the~~ edge of ravine  
 of ~~La~~ Caña in alluvial  
 fan just above Villavicencio,  
 Meta 665 m.

densely wooded ravine

2 72

*Remigia pedunculata*

Anal. Bellis

q+c - N.M.T

cin 0.9

quin N.M.T

T.C.A. 0.9

4 73

*Remigia pedunculata*

Anal. Bellis

q+c - 1.5

cin N.M.T

quin 0.2

T.C.A. 1.7

L 3 74

edge of woods

tree 5 m. tall, 2 forks,  
 from near base, one 4 cm.  
 diameter 7 cm. thick,  
 flower, white (2 bark  
 samples one from each  
 fork) (collection of  
 stipules taken at  
 random from branches  
 of same tree; sticky substance  
 between stipules)

*Remigia pedunculata*  
 common, but not dominant,  
 all trees seen small.

small sterile tree 7 m.  
 tall, 8 cm. thick (bark  
 sample) (collection of stipules  
 taken at random from same  
 tree); sticky substance  
 between stipules)

small tree, almost  
 sterile, a few buds present.  
 6 m. tall, 10 cm. diam.  
 sticky substance between  
 stipules (bark sample)  
 (collection of stipules  
 taken at random from same  
 tree) (bark peels easily,  
 moist).

vine, fls. white

bark  
 closely  
 tightly  
 adherent,  
 rubbery.



22075  
7*Remigia pedunculata*

Anal. Bellis	
Q+C	1.7
Cin	0.2
Quin	0.4
T.O.A	2.3

✓ Aug. 5 - along Bogota-Villaviciencio road in gulch above Villaviciencio, Meta alt. 900 m. steep gulch side below road.

L. 5 76 *Warczewiczia coccinea*

L. 2 77 *Gurania*  
climbing in shrub by road

L. 1 78  
climbing in *Warczewiczia*

Aug. 6 - Buenavista, hills above Villaviciencio, Meta second growth forest on 1200-1230 m. steep east slope

L. 4 79 *Mikania*  
common along roads & trails

small tree 5 m. tall, 8 cm. thick in lower horizontal part of trunk, mainly a group of sprouts from broken trunk. Lower portion of this, peeled, youngest growth sticky & copper-red, flowers white (bark sample) (stipules collected from same tree at random) sticky substance between stipules.

small tree, ~~bracts~~ <sup>enlarged calyx</sup> brilliant scarlet, bracts yellow.

vine, calyx deep <sup>red</sup> orange, ~~stamens~~ petals orange. immature fruits green, shiny, longitudinally variegated with pale green.

vine climbing in shrubs & trees, flowers white.



L 2030

Columnea

in dense shade, common

L 2 81

Lymbolanthus

lower edge of forest

L 4 82

Palicourea

upper edge of forest

L 4 83

Lchirocalyx

upper edge of forest, common

L 4 84

upper edge of forest

L 4 85

Lippaurea

upper edge of forest

L 1 86

Phoradendron

parasitic on Ramisia pedunculata,

upper edge of forest

12 87

Ramisia pedunculata

upper edge of forest, rare

L 5 88

edges of forest

stem fleshy, leaves  
deep purple beneath,  
deep green ~~above~~ above,  
calyx vermilion.

corolla silvery-cream.

~~shrub~~ shrub with  
sharply square stems,  
flowers pale green.

somewhat x ygomeris-like.

small tree 5 m. tall.

infl. purple in fruit.

small tree 5 m. tall.

infl. dry.

shrub, fls. green.

leathery, stripes of green fruit red.

shrub, aromatic, fruit.

red, fig-shaped.

plant olive-green.

Anal. Bellis  
q+c 1.2  
oil 0.9  
aim. est. 0.1  
TCA 2.2

small tree 5 m. tall, 7 cm. thick,  
cankers on lower part of  
trunk, leaves yellowish, small,  
veins impressed above.

fls. white & bark sample from  
above cankered part! stipules  
collected at random from same  
tree! sticky substance between  
stipules.

spreading by runners  
flowers scarlet.



Aug. 13 - Went out into the Sabana de Bogota, and a day or two later flew over parts of it.

Large areas have been submerged since April by the heavy rains. The water does not seem to drain off. I do not know the reason for this. The people say that it is just that there are more rains this year than before. It is obvious that the denuding of the hills accounts for the accumulation of water, but its failure to run off must be due to something else, possibly a slight tilting of the strata of the valley, possibly connected with the earthquakes

of a few months ago. Floating aquatics such as Azolla and Limnobium are covering parts of the area.

The Eucalyptus globulus that lines many of the boundaries is finally showing the effects of the prolonged submergence of its roots. Whole rows are dying. The Falix humboldtii is not affected.

~~a noticeable effect~~  
A peculiar thing about these Eucalyptus is that in certain places, large trees have preserved their blue, juvenile foliage. The reason for this is not obvious, as they are growing side-by-side with normal trees of the same size.



Aug. 17 - Fundación,  
Magdalena

along city streets and ~~some~~  
railroads, weedy places.

L. 2 90

Sida

L. 2 90

Cuphea

L. 2 91

Euphorbia pilulifera L.

L. 2 92

Boerhaavia

grassy place along road

L. 3 93

Hedyotis

grassy place below curbstones.

Aug. 18 - Santa Marta, Magd.  
along water-front 1 m.

L. 2 94

Mollugo verticillata L.

railroad embankment

L. 3 95

Portulaca oleracea L.

around buildings

L. 3 96

Boerhaavia

along road, common.

L. 3 97

Amaranthus

along road

L. 3 98

Boerhaavia

along roads, common

L. 2 99

Ipomoea

cultivated, climbing  
on buildings & fence

fls. orange-yellow  
fls. magenta, branches  
more or less in one plane.

fls. white, hairy within.  
turning pinkish, leaf  
veins impressed above.  
fls. white, corolla  
short - salverform.

Hills above beach, thorn-forest  
of Prosopis & Cereus.

prostrate or almost so,  
fls. white.  
plant fleshy, ascending  
fls. yellow, stamens few 10-15  
"verdulaga" used medicinally.  
ascending, annual.

fls. pale pinkish.  
leaves white beneath, margins  
undulate - crispate.

erect, red stemmed  
herb, ~~to~~ up to 1 m. tall.  
sub-prostrate, extensive  
herb, much branched,  
fls. crimson to dark red.  
vine, partly hirsute,  
partly glabrous, fls.  
white with purple  
throat.



22100 *Heliotropium curassavicum* L.  
common along paths  
+ around seeps.

L.3 01 *Trianthema portulacastrum*  
common along roadsides

L.3 02 *Lesuvium portulacastrum*  
common along roadsides

L.2 03 *Eclipta alba*  
in seep just above beach

L.4 04 *Jussiaea*  
in seep just above beach,  
with #22105

L.3 05 *Jussiaea*  
in seep just above beach  
with #22104

very glaucous, fleshy,  
flowers white with  
greenish center, nutlets  
coherent, externally  
fleshy.

— prostrate, leaves  
thin-fleshy, stems  
reddish, fls. pink.  
— prostrate, stems  
green, leaves spreading,  
glaucous, somewhat  
compressed but fleshy,  
fls. very pale lavender.  
(this is common form,  
but others seen <sup>(set #22100)</sup>  
— with more anthocyanin)  
— large herb, spreading  
and much branched,  
stem <sup>dark</sup> red-brown, fls. white.  
— herbaceous, forming  
large deep mat,  
fls. yellow, 5 parted,  
petals <sup>broadly</sup> oblong-obovate,  
easily caducous.  
— herbaceous, forming a  
large deep mat, fls.  
5 parted, petals clawed,  
~~cream~~ broadly obovate,  
cream-white distally  
yellowish at base,  
leaves with "metallic"  
sheen, especially beneath.



thorn forest on flats  
back of beach, mostly  
*Prosopis*, *Guaiacum*, *Acacia*,  
*Pereskopsis*, *Calotropis*, *Cereus*.  
L22106 *Lesuvium portulacastrum*  
on flat in openings

L2707 *Calotropis procera* (L.) Ait. f.  
abundant, this plant  
on sand dune, others  
on flats and slopes

L2408 *Prosopis*  
abundant, dominant  
in vegetation

L2409 *Guaiacum*  
abundant, conspicuous  
in vegetation

L2310 *Acacia*  
common

shaly talus slope above beach,  
at base of cliff.

L211 ledge at top of talus.

prostrate, carpet-forming,  
stems red, leaves  
spreading, green,  
flat, fleshy, fls.  
pink.

— small tree 3 m. tall,  
wood weak, trunk  
10 cm. thick near  
base, leaves gray-  
green, sap milky,  
fls. white with  
inside of lobes dull  
purple, crown segments  
bright purple distally,  
fruit strongly  
inflated.

— flat-topped tree 4 m. tall,  
fls. greenish yellow,  
mostly on rather  
old wood.  
— tree 5 m. tall, fruit  
orange-yellow.

bush 2 m. tall, fls.  
orange-yellow.

~~small~~ suffrutescent herb  
forming rounded clump.



22112 Sporobolus

2 13 Portulaca

✓ grounds of Prado of Magdalena Fruit Co.

L 1 14 Heliotropium

weed in lawn around house

L 4 15 Spilanthes musc. Jacq.

weed in lawn around house, common

L 2 16 Heliotropium

weed in lawn in prado

L 2 17 Quisqualis indica

cultivated, climbing on fence

L 5 18 Tribulus cistris

abundant weed

L 4 19 Prosopis

in grounds, cultivated  
but probably spontaneous.

L 20

parasitic on Prosopis,  
commonly seen also on  
Terminalia catappa and  
other trees.

L 3 21 Euphorbia pilulifera L.

weed near house

L 3 22 Ixora

ornamental in lawn, cult.

L 3 23 Jasminum azoricum

cult. climbing on bushes

L 3 24 Alcaimanda cathartica

cult, climbing on trellis

small tufts, spikes  
— mostly erect.  
fleshy herb with enlarged  
roots, leaves sub-terete,  
appressed to stem,  
— bronze-green.  
erect, fls. lavender

prostrate, mat-forming,  
— heads white.  
flowers white

vine, buds red without,  
— fls. white, turning red.  
prostrate, flowers  
— bright butter yellow.  
flat topped tree 6 m.  
tall, 25 cm. thick,  
branches drooping,  
leaves slightly blue-  
— green.  
flowers white, ripe  
berries red, oblong.

shrub, flowers scarlet,  
— ripe fruit red (only 1 seen ripe)  
vine, fls. white with  
— yellowish tube, very fragrant  
vine, ~~the~~ sap somewhat  
milky, fls. bright yellow.



194

1944 - Colombia

- weedy roadside  
 L. 22125 *Cassia*  
 trampled place  
 L. 2 26 *Ruellia*  
 L. 4 27 *Rauwolfia tetraphylla* L. det. S. Smith, 83  
 L. 4 28  
 very abundant  
 Barrio del Prado,  
 Aug. 20 - Barranquilla, Atl.  
 L. 3 29  
 cultivated, grounds of Hotel del Prado  
 weeds in vacant lot.  
 L. 4 30  
 common  
 L. 1 31  
 common  
 L. 1 32 *Abutilon*  
 L. 1 33 *Pilea*  
 common  
 L. 2 34  
 common  
 L. 1 35  
 L. 2 36

Magdalena - atlantico

195

- prostrate, fls. yellow  
 fls. blue-violet, throat  
 plicate  
 shrub 1 m. tall (others  
 2 m.) fls. white, fruit red.  
 forming mats

tree 15 m. tall

fls. magenta

fls. white

fls. orange-yellow  
 fls. white







198

199



Correction for temp. °C.: \_\_\_\_\_  
Corrected polarimeter reading: \_\_\_\_\_  
% Quinine sulfate heptahydrate ----- %  
% Cinchonidine sulfate trihydrate ----- %  
  
Cinchonine & gooch -----  
Gooch -----  
Cinchonine -----  
For solubility in c.c. alcohol -----  
Corrected weight cinchonine -----  
% Cinchonine (anhydrous) ----- %  
  
Quinidine hydroiodide & gooch -----  
Gooch -----  
Quinidine hydroiodide -----  
For solubility in c.c. alcohol -----  
Corrected weight quinidine hydroiodide: -----  
% Quinidine (anhydrous) ----- %  
  
% Total of quinine, Cinchonidine, Cinchonine & Quinidine (each anhydrous): -----

-- Report sent to office

Signed - Analyst



-- Received at laboratory

Date

-- To drying room

-- From drying room

Description of dry bark:

Tests - Grahe:

Dragendorf:

Ulan:

Bark sample weight-----: \_\_\_\_\_ gms.

Quinine & cinchonidine tartrates & gooch:

Gooch-----: \_\_\_\_\_

Tartrates-----: \_\_\_\_\_

For solubility, filtering temp: \_\_\_\_\_ °C: \_\_\_\_\_

Corrected weight tartrates-----: \_\_\_\_\_

% Quinine plus cinchonidine (anhydrous)-----: \_\_\_\_\_ %

Polarimeter reading-----: \_\_\_\_\_ min

Correction for temp. \_\_\_\_\_ °C.: \_\_\_\_\_

Corrected polarimeter reading: \_\_\_\_\_

% Quinine sulfate heptahydrate-----: \_\_\_\_\_ %

% Cinchonidine sulfate trihydrate-----: \_\_\_\_\_ %

Cinchonine & gooch-----: \_\_\_\_\_

Gooch -----: \_\_\_\_\_

Cinchonine-----: \_\_\_\_\_

For solubility in \_\_\_\_\_ c.c. alcohol---: \_\_\_\_\_

Corrected weight cinchomine-----: \_\_\_\_\_

% Cinchonine (anhydrous) -----: \_\_\_\_\_ %

Quinidine hydroiodide & gooch-----: \_\_\_\_\_

Gooch-----: \_\_\_\_\_

Quinidine hydroiodide-----: \_\_\_\_\_

For solubility in \_\_\_\_\_ c.c. alcohol---: \_\_\_\_\_

Corrected weight quinidine hydroiodide: \_\_\_\_\_

% Quinidine (anhydrous)-----: \_\_\_\_\_ %

% Total of Quinine, Cinchonidine, Cinchonine & Quinidine (each anhydrous): \_\_\_\_\_

-- Report sent to office

Signed - Analyst



Name

Sample No.

Address

Date received

Source

Roots

Identification

Trunk

Branches

Geographical data

Zone

Altitude

Color

Instructions to Laboratory

Priority Status

1

2

3

Special Instructions

---

Signed

---

Name of Lab. and Date Delivered to Lab.

Remarks



Date

-- Received at laboratory

-- To drying room

-- From drying room

Description of dry bark:

Tests - Grahe:

Dragendorff:

Ulan:

Bark sample weight-----: \_\_\_\_\_ gms.

Quinine &amp; cinchonidine tartrates &amp; gooch:

Gooch-----: \_\_\_\_\_

Tartrates-----: \_\_\_\_\_

For solubility, filtering temp: \_\_\_\_\_ °C:

Corrected weight tartrates-----: \_\_\_\_\_

% quinine plus cinchonidine (anhydrous)-----: \_\_\_\_\_ %

Polarimeter reading-----: \_\_\_\_\_ min



200



